

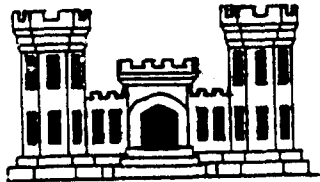
MOHAWK RIVER BASIN

COLONIE DAM

SARATOGA COUNTY, NEW YORK

INVENTORY NO. N.Y. 204

PHASE I INSPECTION REPORT NATIONAL DAM SAFETY PROGRAM



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NEW YORK DISTRICT CORPS OF ENGINEERS

AUGUST, 1978

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19. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Colonie Dam was judged to be unsafe non-emergency due to a deteriorated spillway channel and eroded downstream channel, as well as seepage along the downstream face and abutment.		

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MOHAWK RIVER BASIN
COLONIE DAM
NY 204
PHASE 1 INSPECTION REPORT

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APPENDIX

- A. DRAWINGS
 - (a) Vicinity Map
 - Topographic Map (USGS)
 - (b) List of Drawings
- B. PHOTOGRAPHS
- C. ENGINEERING DATA CHECKLIST
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PHASE 1 REPORT
NATIONAL DAM SAFETY PROGRAM


Name of Dam: Colonie Dam (I.D. No. NY 204: Mohawk W.S.)
State Located: New York
County Located: Saratoga
Stream: Stony Creek (tributary of the Mohawk River)
Dates of Inspection: June 28 and July 6, 1978

ASSESSMENT

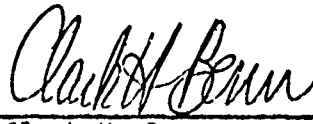
Colonie Dam is composed of an earth embankment and a concrete spillway structure, the visual inspection of which revealed the following deficiencies:

- (1) The spillway slabs have cracked and settled indicating the presence of voids beneath. Subsurface investigation of the slab foundation is required to determine the extent and origin of the voids.
- (2) Seepage along the toe of the downstream face and at the south abutment should be periodically and systematically observed and measured.

The total discharge capacity of the spillway is inadequate to pass the Probable Maximum Flood (PMF). The spillway is capable of discharging one half the PMF without flashboards, but not with flashboards.


George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

Approved By:


Col. Clark H. Benn
New York District Engineer

Date:

27 September 1978



Overview of Colonie Dam Looking North

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
COLONIE DAM, I.D. NO. NY 204
MOHAWK WATERSHED
SARATOGA COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

Evaluation of the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to life and property and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of the Dam and Appurtenant Structures

The Colonie Dam is composed of an 807 foot long earth embankment and a 119 foot wide concrete spillway north of the embankment.

The maximum height of the embankment above the old stream bed, which is located slightly south of the center of the embankment, is 47 feet. The crest of the embankment is 20 feet wide, the upstream slope is 1 vertical on 2.5 horizontal and the downstream slope is 1 vertical on 2 horizontal. The spillway is located in a cut section north of the embankment. The exposed slopes and crest of the dam are covered with grass. The submerged portion of the upstream slope which was visible, is protected by riprap. A concrete core wall is located along the centerline of the dam approximately 807 feet long, top elevation 260.0, extending to elevation 207.0 in a stepped manner. The wall rests on a footing with a maximum dimension of 5 feet in width and 1.5 feet thick. The thickness of wall varies from a maximum of 2 feet at the lowest elevation of the wall to 1 foot at the top. The plans indicate that the footing is supported on impervious material and Bethlehem steel sheet piling SP-4 or equivalent. The sheet piling is intended to act as a cut off wall beneath the core wall. The sheet piling extends to bedrock, refusal or 25 feet below the core wall footing. The ungated spillway is constructed of reinforced concrete. The elevation of the spillway crest is 255.0. Flashboards measuring 2.7 feet in height were in place at the time of the inspection beneath a steel bridge. The bridge spans the entire spillway with an intermediate pier located in the center of the spillway. An unobstructed channel of 58.5 feet exists on each side of the center pier. The bottom of the bridge steel is at elevation 263, which corresponds to the top of dam elevation.

The intake structure is a reinforced concrete tower located near the upstream toe of the embankment. From this tower a 30 inch cast iron pipe carries the flow through the concrete core wall to the downstream toe of the embankment where the flow bifurcates into 2 - 24 inch cast iron pipes. One pipe directs flow into a plunge pool to dewater the reservoir, and the other directs flow to a control building. From the control building, the flow is directed to the water treatment facility on River Road in the Town of Colonie.

b. Location

Colonie Reservoir is located on the Stony Creek, a tributary of the Mohawk River, 0.6 miles northeast of the intersection of Crescent and Vischer Ferry Roads. The nearest village is Vischer Ferry located 0.5 miles southwest of the intersection. This is the only settlement between the dam and the Mohawk River.

c. Size Classification

The dam is 47 feet high and is classified as an "intermediate" dam (between 40 and 100 feet high).

d. Hazard Classification

The dam is classified "high" hazard because of the presence of approximately 35 homes immediately downstream.

e. Ownership

Colonie Dam is owned and operated by the Latham Water District of the Town of Colonie.

f. Purpose of Dam

The dam provides storage for the Town of Colonie water supply system.

g. Design and Construction History

The dam and its appurtenant structures were designed by Keis & Holroyd, Consulting Engineers, in 1950. No information was available on the award of the construction contract.

The dam was put into operation in 1954.

h. Normal Operating Procedures

Water is released from the reservoir either by the low level outlets or over the spillway. Two low level outlets are located in the control tower at elevations 234.0 and 250.0. An additional intake located at elevation 226.0 is operational but not in use. The water is pre-chlorinated near the toe of the dam and piped to the water treatment plant.

1.3

PERTINENT DATA

a. <u>Drainage Area</u> (sq. mi.)	11.2
b. <u>Discharge at Dam Site</u> (cfs)	
Maximum known flood (May 7, 1958 and Feb. 1960)	10
Maximum pool (El. 263)	10,800
Maximum Pool w/flashboards	5,800

Maximum capacity of low level outlets (Estimated)	9
Total Discharge at Max. Pool (El. 263) W/flashboards	5,809
Average daily discharge	3.9 to 4.7

c. Elevation (USGS datum)

Top of dam	263.0
Spillway crest	255.0
Tailrace channel	221.0 ±
Invert low level outlet	226.0
Inlets of Control Tower	234.0 and 250.0

d. Reservoir

Length of maximum pool, miles	2.2
Length of shoreline (spillway crest), miles	7.0
Surface area (spillway crest), acres	295.0

e. Storage (acre-feet)

Spillway crest	5,500
Top of flashboards	6,300
Top of dam	8,100

f. Dam

Embankment type: Earth fill with central concrete corewall
resting on cut-off wall of steel sheet piling

Embankment length, ft.	807
Upstream slope	1 on 2.5
Downstream slope	1 on 2.0
Impervious core: reinforced concrete core wall	
Length (ft.)	807
Top Elevation	260.0
Max. bottom elevation	207.0
Max. footing width (ft.)	5.0
Max. wall bottom width	2.0
Max. wall top width	1.0

Cut-Off Wall: steel sheet piling Bethlehem SP-4 or equivalent
extending to bedrock, refusal or 25 feet below
footing of core wall.

Crest width, ft.	20
Grout curtain	none

g. Spillway

Type: Ungated, reinforced concrete	
Length, ft.	119
Crest elevation (USGS)	255.0
Upstream channel: Riprapped	
Downstream channel: Irregular riprap and crushed stone, discharge into Stony Creek	

h. Regulating Outlets

Upstream - Control tower located near toe of upstream
30 inch cast iron pipe between control
tower and downstream toe.

Downstream - Two 24 inch cast iron pipe branch from
30 inch cast iron pipe regulated by 2 -
24 inch gate valves. 4-inch cast iron
pipe carries flow to treatment plant. The
other is used to draw from the reservoir.

SECTION 2: ENGINEERING DATA

2.1 DESIGN

a. Geology

The Colonie Dam lies within the "Hudson Mohawk Lowlands" physiographic province of New York State. The general topography of this area resulted from erosion along outcrop belts of weak rocks. The topography is of low elevation and relief. Bedrock in the vicinity of the dam is primarily Ordovician (500 - 435 million years ago) shale and sandstones which have been exposed by westward and southward stripping-off of Silurian and Devonian Limestones. The present surficial soil deposits have resulted from glaciations during the Cenozoic Era (most recent 65 million year period), the last of which was the Wisconsin ice sheet approximately 11,000 years ago. These soils were deposited during the existence of glacial Lake Albany. The Mac Gregor Fault is located in the vicinity of the dam. It is a normal fault caused by gravity forces.

b. Subsurface Investigations

Three subsurface investigations were conducted in 1949 and 1950. The first by Keis & Holroyd in October 1949, the second by Claude S. Young in February 1950, and the third in March or April 1950, by Keis & Holroyd. A subsurface exploration location plan and soil profile has been included in the Appendix A for the first and third investigations. The second investigation may have been conducted at an alternate location as the soil profiles do not agree with those prepared by Keis & Holroyd. The boring logs of the second investigation have been included in Appendix A for informational purposes.

In general, the surficial soils at the project site consist of a thin layer of fine sand, over yellow and blue clay, over fine sand, over hard sand and gravel with decomposed shale fragment. Borings were progressed to refusal. Although no coring below refusal elevation was undertaken, the bottom of borings is assumed to be bedrock. The assumed bedrock surface is first encountered at elevation 170 near the edge of the spillway at the north end of the embankment, then drops to elevation 167 in the next boring and gradually increases to elevation 196 near the old stream channel of Stony Creek.

c. Embankments and Appurtenant Structures

The dam was designed by Keis and Holroyd, Consulting Engineers, of Troy, NY. Forty drawings were prepared for this contract and included the construction of the treatment plant. Selected drawings have been included in Appendix A. The design of this dam includes the use of a concrete core wall and a steel sheet piling cut-off wall to control seepage thru and under the dam. Subsurface information reveals varying thicknesses of permeable sand and soft consolidation prone clay beneath the embankment. The concrete core wall could have sustained damage during consolidation of this clay increasing the potential for seepage. In addition, the cut-off wall is not water tight and does not extend completely thru the sandy subsoil.

2.2 CONSTRUCTION RECORDS

Photographs were reviewed at the Town of Colonie Latham Water District and are available for future investigations. Two of these have been included in Section B of the Appendix. No other information regarding

the construction of the dam was available.

2.3 OPERATION RECORD

The reservoir level and discharge into the water supply system are recorded daily. No maintenance or operation manual has been prepared. All maintenance and repair work records are filed in the Latham Water District headquarters. The dam is visually inspected on an irregular basis.

2.4 EVALUATION OF DATA

The data presented in this report has been made available by the Town of Colonia. In addition, the personnel of the Latham Water District have contributed valuable observations of the structure's performance, operation and maintenance. This information has been invaluable in the preparation of this report and appears adequate and reliable for Phase 1 inspection purposes.

SECTION 3: VISUAL INSPECTIONS

3.1 FINDINGS

a. General

Visual inspections of Colonie Dam and the surrounding watershed were conducted on June 28 and July 7, 1978. The weather was clear and temperatures ranged in the seventies. The inspections were conducted during a basically dry period during which intermittent thunder storms occurred. The reservoir level at the time of inspection was 2.6 feet above the spillway crest level due to the presence of flashboards. These flashboards were leaking such that approximately one-half inch of water was flowing down the spillway.

b. Embankment and Abutments

The earth embankment, which was completed in June 1953, shows no signs of distress. The vertical and horizontal alignment of the crest appears to be unchanged, with no visible cracks on the embankment slopes or crest. There is no evidence of sliding or sloughing and no depressions observed. Grass covers the exposed portions of the embankment with some vegetative growth of shrubs and small trees near and along the walls of the spillway. Visual inspection of the surface beyond the toe of the dam could not be completed due to the presence of dense vegetation west of the service road. The following conditions were observed:

(1) Seepage appears along the south abutment contact and 1 to 3 feet above the toe of the downstream slope near the center of the embankment. No particle removal was observed, however, the seepage near the abutment had a rusty appearance and some surface scum was noted. A toe drain was constructed in 1973 to collect seepage from 3/4 inch copper tubing installed to remove seepage from springs encountered during construction. Maintenance personnel have observed seepage along the toe of the downstream face since the construction of the dam. This drain consisted of a 6 inch perforated corrugated metal pipe imbedded in crushed stone and pitched to an open grated manhole near the south center of the embankment. The drain flows from both the north and south toward the manhole. A 12 inch corrugated metal pipe directs the seepage beneath the service road and in an open channel west of the service road. At the time of the inspection, approximately 2 to 3 gallons per minute were flowing into the 12-inch pipe. The drain was installed primarily to facilitate mowing operations, since equipment was having difficulty traversing the slope.

A soft wet area was also observed approximately 50 feet west of the embankment toe near the outlet of an 8 inch clay pipe below the south wall of the spillway. No flow was observed from this area. The 8 inch pipe located about 10 feet west of this area was flowing one-half full. The purpose of this pipe is unclear and should be investigated to determine its source.

c. Spillway

The spillway is constructed of mesh reinforced concrete slabs on earth with two reinforced concrete walls retaining the embankment on the south and the original grade on the north. The spillway was constructed in a cut section. The spillway slabs do not appear to be adequately supported and some cracking of the walls of the spillway were observed.

The following deficiencies are noted:

(2) The spillway slabs are distorted and broken with a maximum differential settlement of 4 inches between slabs. Expansion joints were permitting vegetative growth indicating the development of cracks between the slabs. Cracks were observed within the slabs indicating loss of foundation support.

(3) A core drilling program was conducted under the owner's supervision in the late 1950's to determine the cause of these problems. The large voids encountered were filled with a concrete slurry. Additional voids were found and a bituminous material was injected. Water was observed during the inspection, flowing from two of these core holes to a maximum height of 6 inches above the slab. Probing in joints and cracks indicates voids beneath these slabs. Maximum probe depth before reaching refusal was 1.6 feet below the top of slab. Water was also observed flowing from the slab joint below the core holes.

(4) Flashboards 2.7 feet in height are being used to increase the capacity of the reservoir, raising the reservoir elevation to 257.7. The steel bars used to retain the flashboards are bent slightly downstream. It could not be determined if these bars were designed to fail at a specific discharge. The oak flashboards are scheduled for replacement this summer.

d. Regulating Outlets

A reinforced concrete control tower, located near the upstream toe of the dam and center of the dam, is used to draw off water from the reservoir through 3 - 24 inch diameter inlets controlled by 24 inch gate valves. The tower has an inside diameter of 10 feet and an outside diameter of 14 feet at the base and 12 feet at the top. The intakes are located at elevations 226, 234 and 250. The lower intake is not in use but is in operating condition. Valve operation is by mechanical means. The upper intakes are in constant use and regularly maintained. Access to the control tower is from the top of the dam via a 120 feet long steel walkway.

e. Downstream Channel

The downstream channel of the spillway is in poor condition. The following deficiencies were noted:

(5) Extensive erosion of the channel bed and banks was observed such that the end of the spillway was being undermined and the easily eroded silty, clay subsoil was exposed. Intermittent

riprap had been placed at the end of the spillway and along the channel. Timber cribbing had also been used approximately 200 feet downstream to protect the 24 inch water supply pipe from the erosion of the spillway. This cribbing is being breached on the north end. Crushed stone was unsuccessfully placed to control this problem. Excavation and trenching operations were evident adjacent to the channel for the purpose of controlling channel flow within the stream bed.

(6) At the extreme northern end of the spillway edge considerable flow was observed. It is believed that this may be flow from beneath the spillway slabs.

f. Reservoir

There are no noticeable signs of landslides or instability in the reservoir area. Some minor sloughing along the eastern shoreline was observed.

3.2 EVALUATION OF OBSERVATIONS

Although deficiencies were observed, there are no indications that the dam is in imminent danger. Some deficiencies are minor and may be corrected by the maintenance forces. The more serious deficiencies represent conditions which have a potential for deterioration and should be further investigated.

The most significant observations are the presence of seepage at the south abutment and the toe of downstream slope, the deteriorated spillway channel, and the eroded downstream channel. Serious erosion could result if investigation and remedial measures are not initiated.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The Colonie Reservoir discharges approximately 2.5 to 3 million gallons per day, into the water supply system of the Town of Colonie. The maximum flow, with booster pumps, is 6 million gallons per day. The Reservoir is a secondary system to the treated water obtained from the Mohawk River. The rate of flow is set by gate valves at the control tower. The flow can be directed through the system toward the treated plant or blown-off through a 24 inch cast iron pipe into a plunge pool formed in the old Stony Creek bed west of the downstream toe.

4.2 MAINTENANCE OF DAM

The dam and appurtenants are maintained in good operational condition. All inlet valves are tested and any debris collected is blown-off by compressed air to clear inlet pipes. Staff is maintained on around the clock basis.

4.3 MAINTENANCE OF OPERATING FACILITIES

The operating facilities are maintained by Latham Water District of the Town of Colonie.

4.4 WARNING SYSTEMS IN EFFECT

No warning system is present.

4.5 EVALUATION

The dam and appurtenant works are maintained in good condition. Estimated drawdown capacity is 9 million gallons per day if the ungated spillway is not utilized. The lowest water level recorded in the reservoir was elevation 248.9 on February 24, 1965.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Colonie Reservoir is located on the Stony Creek, a small tributary of the Mohawk River. The total drainage area at Colonie Dam is 11.2 square miles. According to the original report, there are 33 homes downstream of the dam and there is little new development apparent in the area. The topography is characterized by gentle slopes running in a general north-south direction interspersed with a few swamps.

5.2 ANALYSIS CRITERIA

No hydrologic data is available for the dam. For the purpose of this investigation, the dam and the spillway were analyzed with respect to their flood control potential and were assessed through the development of Probable Maximum Flood (PMF) for the watershed. The hydrologic analysis was based on the Synthetic Hydrograph method of the Soil Conservation Service (SCS). This SCS method establishes the hydrograph peak inflow. A short-cut, approximation method of flood routing is then used to determine the reservoir storage/peak outflow relationship.

The Probable Maximum Precipitation (PMP) was determined to be 21.5 inches for a 6 hour duration, 10 square mile basin and runoff was estimated at 15.3 inches taking into account the type of soil and land use development within the watershed. Peak rate of inflow was estimated at 14,200 cfs.

A further analysis was performed using the Snyder's Synthetic Unit Hydrograph Method and the peak rate of inflow was determined to be 14,200 cfs. The estimated quantity of inflow for both analyses is identical.

5.3 SPILLWAY CAPACITY

The spillway is ungated and its overall length is 119 feet. A 2 feet wide pier at the center of the spillway divides it into two equal sections of 58.5 feet. The nearly flat crest is topped by 2.7 feet high flashboards. The maximum head possible between the crest and the top of the dam is 8 feet. The design indicates 2.0 feet high flashboards, but this was modified prior to construction and 2.5 feet high flashboards were installed. At some later date the flashboards were rehabilitated and extended to their present height of 2.7 feet, reducing the maximum head possible to 5.3 feet. No data was available on the discharge rating of the spillway, therefore the weir coefficient was given assumed values ranging from 3.41 to 4.08 depending upon discharge head. The computed capacities at the maximum head (top of dam) are 10,800 cfs without flashboards and 5800 cfs with flashboards.

5.4 RESERVOIR CAPACITY

The length of the reservoir is 2.2 miles and the length of shoreline is approximately 7 miles at spillway crest. The surface area at spillway crest is 295 acres and the reservoir capacity is 5500 acre-feet. The surface area with the existing 2.7 feet high flashboards is 314 acres and the reservoir capacity is 6300 acre-feet. The reservoir capacity at the top of the dam is 8100 acre-feet. This results in a surcharge storage of 2,600 acre-feet above spillway crest and is equivalent to a runoff depth of 4.35 inches over the drainage area.

5.5 FLOODS OF RECORD

The highest water levels recorded since completion of Colonie Dam (June 1953) occurred in May, 1958 and February, 1960.

The records of these levels at the dam are as follows:

Date	Elev. (feet)	Discharge (cfs)
May 7, 1958	257.8	10
Feb. 12, 1960	257.8	10

5.6 OVERTOPPING POTENTIAL

The maximum capacities of the spillway are 10,800 cfs without flashboards and 5,800 cfs with flashboards. The Probable Maximum Flood peak outflow is 14,200 cfs. Half of the Probable Maximum Flood outflow is 7,100 cfs resulting in an overtopping of the dam by 7 inches.

5.7 EVALUATION

The capacity of the spillway is adequate to pass standard Project Flood, which is usually half of PMF, but inadequate with the installed flashboards. Flashboards with spring mechanism that fail under specific head should be installed if storage above crest level is required.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observations did not indicate any signs of major distress in connection with the earth embankment. The spillway slabs, however, do show signs of differential movement and loss of foundation support. Some minor cracking of the spillway and seepage at the south abutment and along the toe of the downstream slope was also evident.

b. Design and Construction Data

No design computations or other data regarding the structural stability of the spillway or earth embankment are available. Other than construction photographs, information concerning the construction of the dam could not be located.

c. Operating Records

Records of operation and repairs which were located are available at the Latham Water District headquarters. No major operational problems which would affect the stability of the dam were reported.

d. Post-Construction Changes

The toe drain described in Section 3.1b was installed in 1973.

Flashboards 2 feet in height were originally designed and installed on the spillway crest. These were replaced at a later date with flashboards 2.7 feet in height. Removal and replacement of existing flashboards is anticipated this summer.

A coring program was initiated in the late 1950's to determine the foundation conditions beneath the spillway slab. Voids found were filled with a concrete slurry and bituminous grout placed where voids were of limited depth. A cut-off wall was also installed at the edge of the spillway slab near the crest. This wall is 18 inches wide and extends vertically five feet below the top of slab and laterally to each spillway wall.

e. Seismic Stability

The dam is located near the boundary between seismic zones No. 1 and 2, therefore, no seismic analyses are warranted. There is minimal information available on the activity of the Mac Gregor Fault. The general consensus of opinion is that the fault does not constitute a threat to the safety of the dam.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of Colonie Dam did not indicate conditions which constitute an immediate hazard to human life or property. The earth embankment is not considered to be unstable. However, seepage beneath the concrete slabs of the spillway channel may lead to the development of hazardous conditions.

For the aforementioned reasons, Colonie Dam requires certain measures and improvements in connection with the most serious deficiencies, some of which should be carried out immediately.

b. Adequacy of Information

The information reviewed is adequate to prepare the Phase I inspection report, with the following exceptions: Conditions beneath the spillway slabs, subsurface and embankment investigations and construction history.

c. Urgency

The stability of the spillway should be investigated immediately. Monitoring of observed seepage should commence immediately. Rehabilitation of the downstream channel should be completed before the next spring run-off period commences.

d. Need for Additional Investigation

To prevent the development of potentially hazardous conditions, investigations should be undertaken to determine the exact nature and cause of the observed seepage and foundation condition of the spillway slab. These investigations should commence immediately and include, but not necessarily be limited to:

- (1) subsurface investigations of the spillway and its foundation including all sampling and laboratory testing necessary to perform a complete stability analysis of the existing structure and determine the integrity of the existing embankment and foundation materials.
- (2) periodic and systematic observations and measurements of the quantity of seepage

The first priority item should be investigation of the condition of the spillway slab and the presence voids and seepage encountered beneath.

7.2 RECOMMENDED MEASURES

- a. Results of the aforementioned investigations will determine the remedial measures required for the spillway and the control of the observed seepage.

Additional improvements listed below can be accomplished by the maintenance forces:

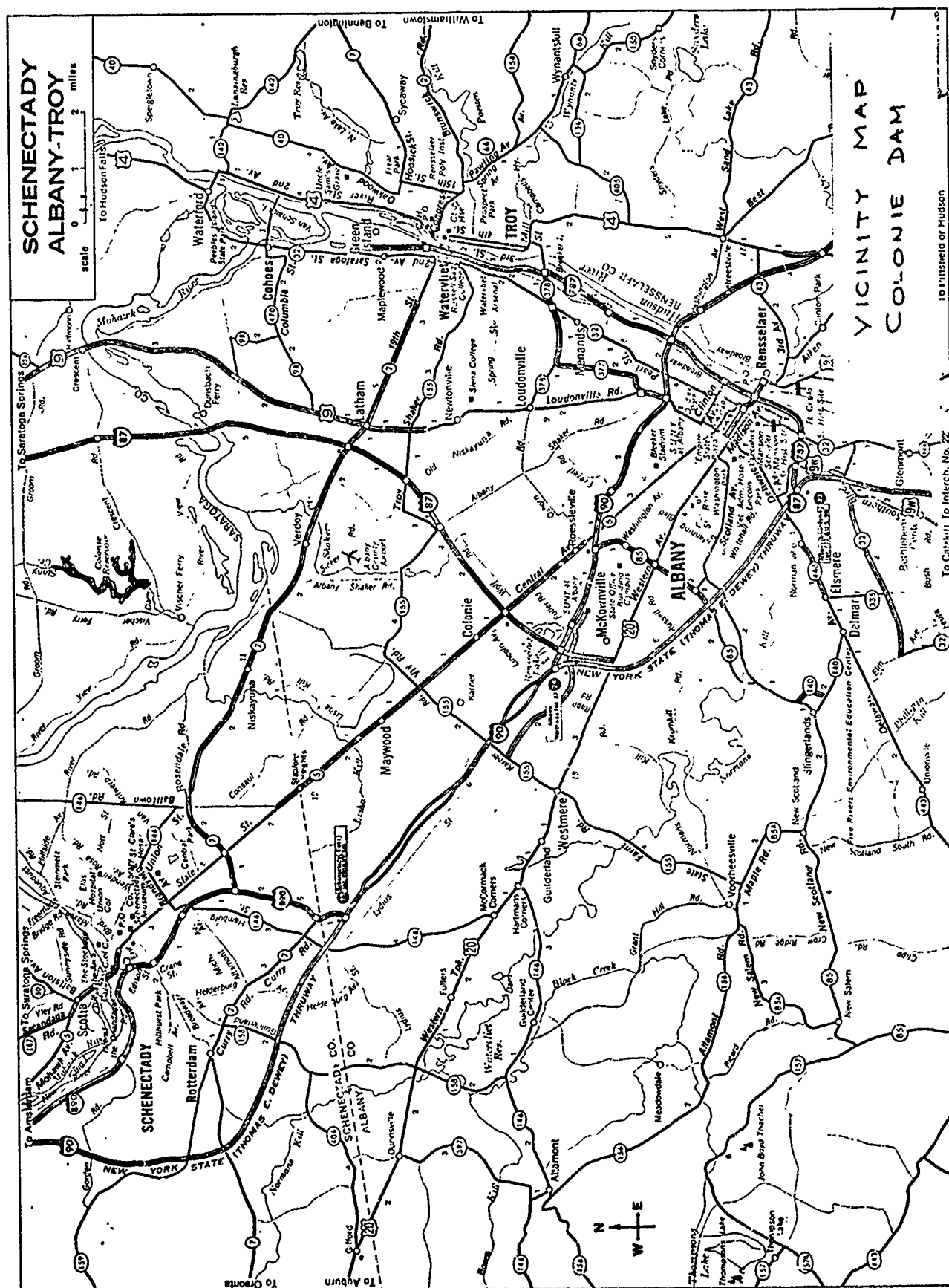
- b. Erosion protection of downstream channel with filter cloth and stone fill of sufficient thickness and size to prevent movement

of stone and loss of clay foundation soil.

- c. Extend the toe drain toward the south abutment to collect the water which was ponded.
- d. The gate operating structure and appurtenant valves should be inspected periodically and systematically repaired as required.
- e. Vegetative growth on the embankment and along the spillway walls should be removed.
- f. Animal burrows on the downstream face should be backfilled and areas seeded.
- g. Spillway walls should be repaired and expansion joints in the spillway slab recaulked.

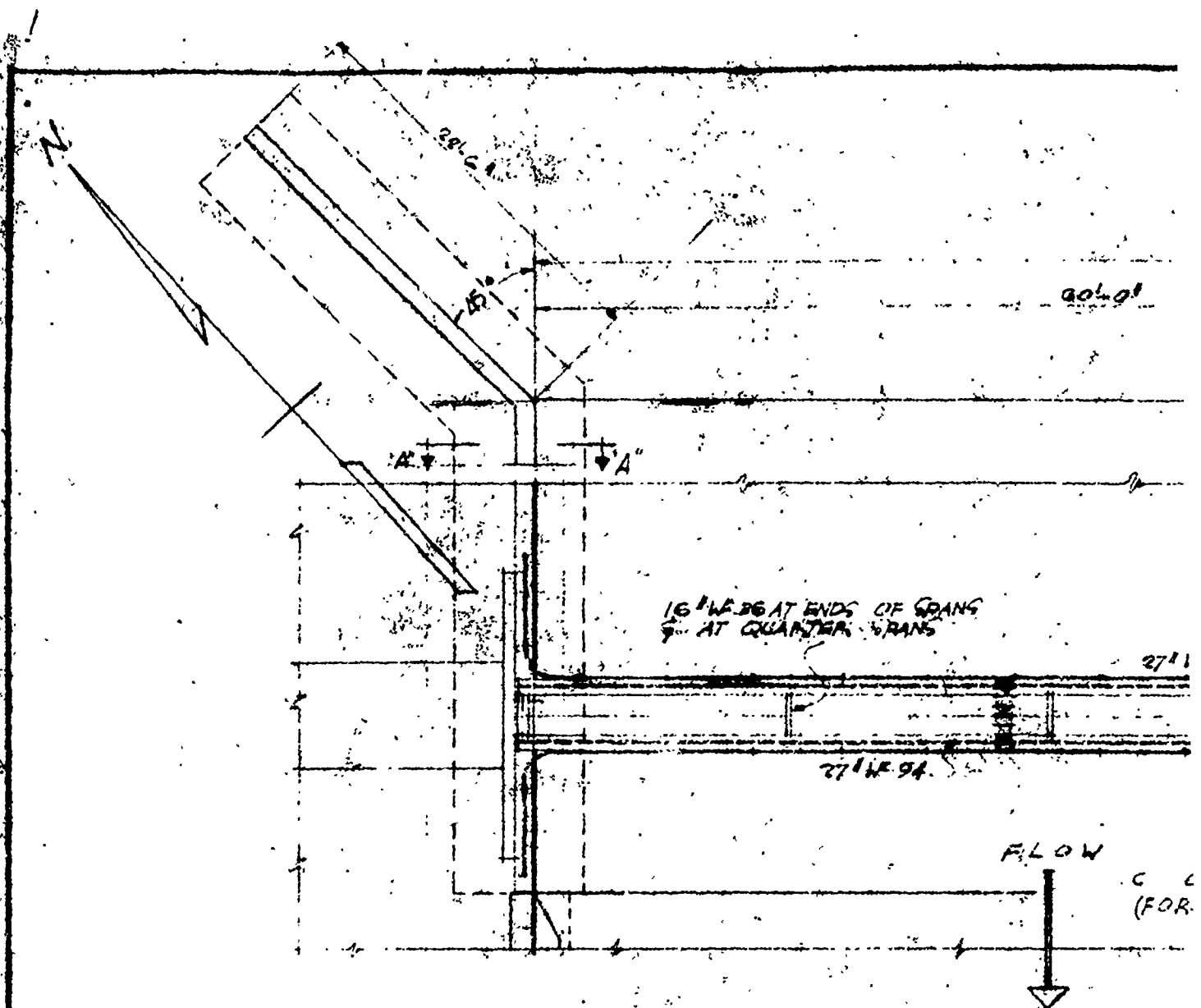
DRAWINGS

APPENDIX A





TOPOGRAPHIC MAP
COLONIE DAM AND RESERVOIR



PLAN

EXPANSION JOINT

6' W. 11' WALK

PARAPET OF WALL EL. 206.50

EXISTING GRADE

TOP OF WALL EL. 208.0

PREMOULDED EXPANSION JOINT

60'-0" SPILLWAY

60'-0"

11' 94"

STANDARD PLATE-KNIFE STEEL
GASTING-SIZE OF BEARING BAR
1 1/2" X 1/8" OR EQUAL (STANDARD)

10' 30" 1/2 ENDS OF SPILLWAY 16" O.D. PIPE RAIL
1/4 QUARTER SPANS

1 DAM

27' 11" 94"

25' 0"

10' 0"

FOR DETAIL OF WALL SEE SHEET 6

CONCRETE SPILLWAY
FOR DETAILS SEE SHEET NO 9

FLOW



N. OF WALKWAY OVER SPILLWAY

SCALE 1/4" = 1'-0"

WALKWAY

60'-11" WALKWAY

16" O.D. PIPE RAILING
POSTS 5' 0" O.C.

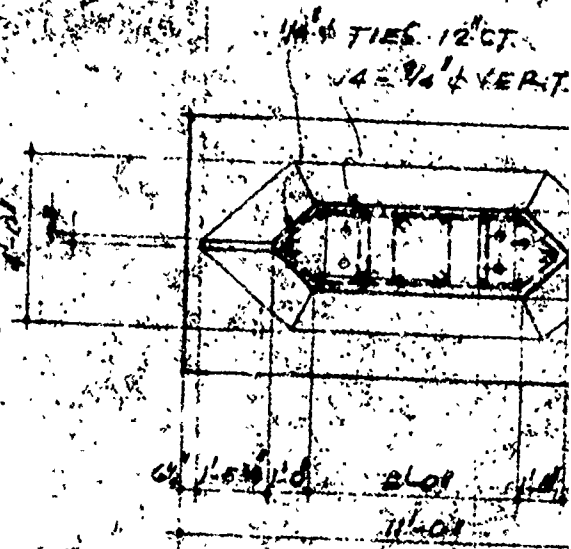
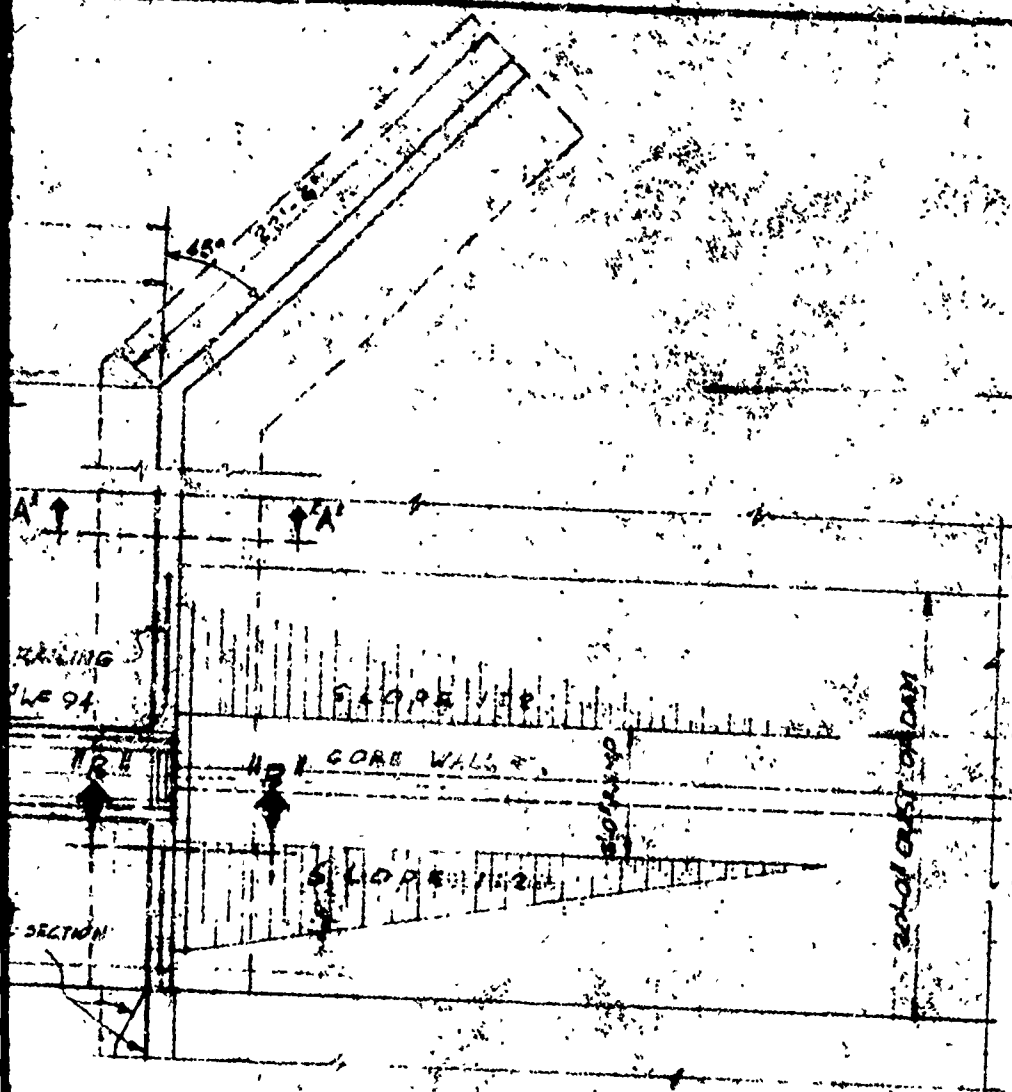
TOP OF RIVER
EL. 405.22

TOP OF WALL BE.

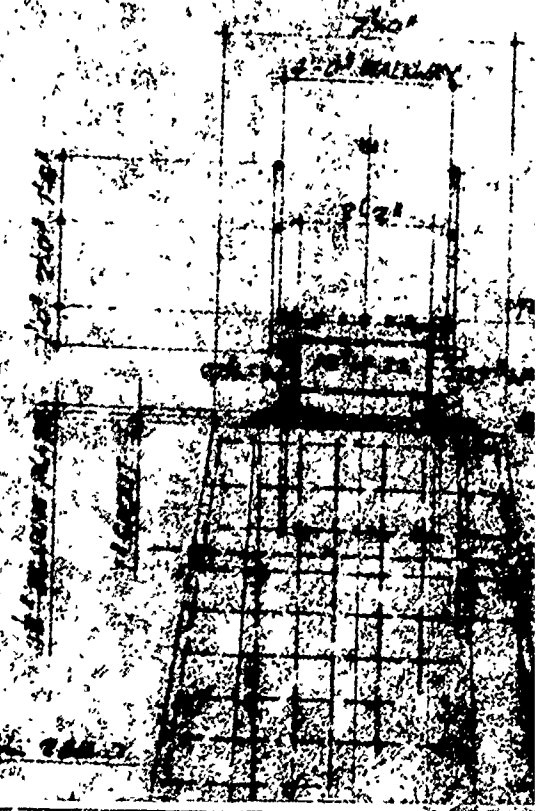
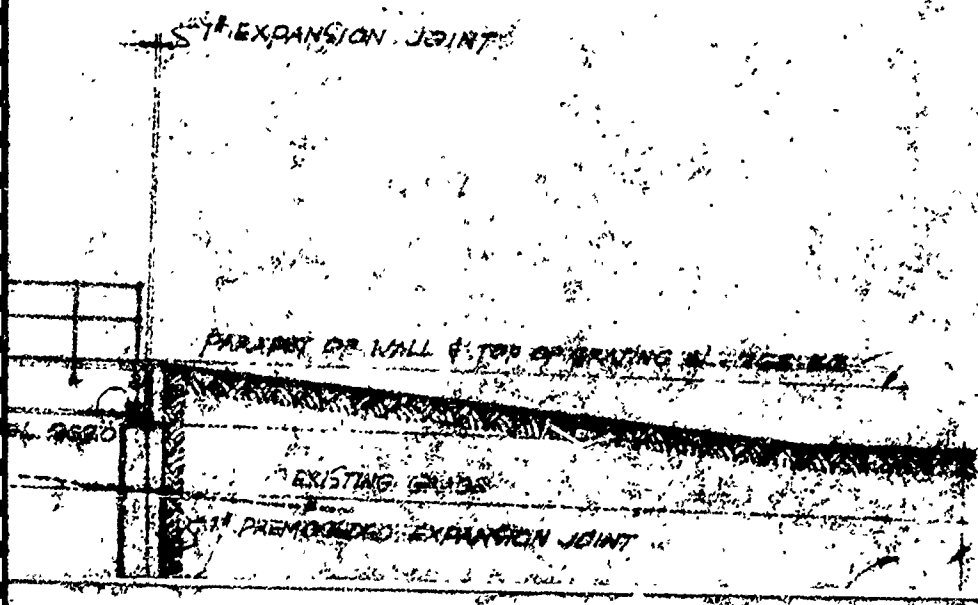
FLOOD WATER LEVEL EL. 260.0

BOTTOM OF SPILLWAY EL. 255.0

110'

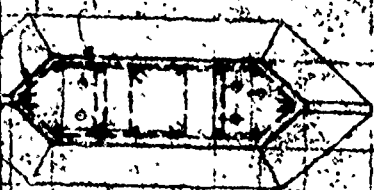


PLAN OF PIER WITH 12' 0" WIDE



$\{a$

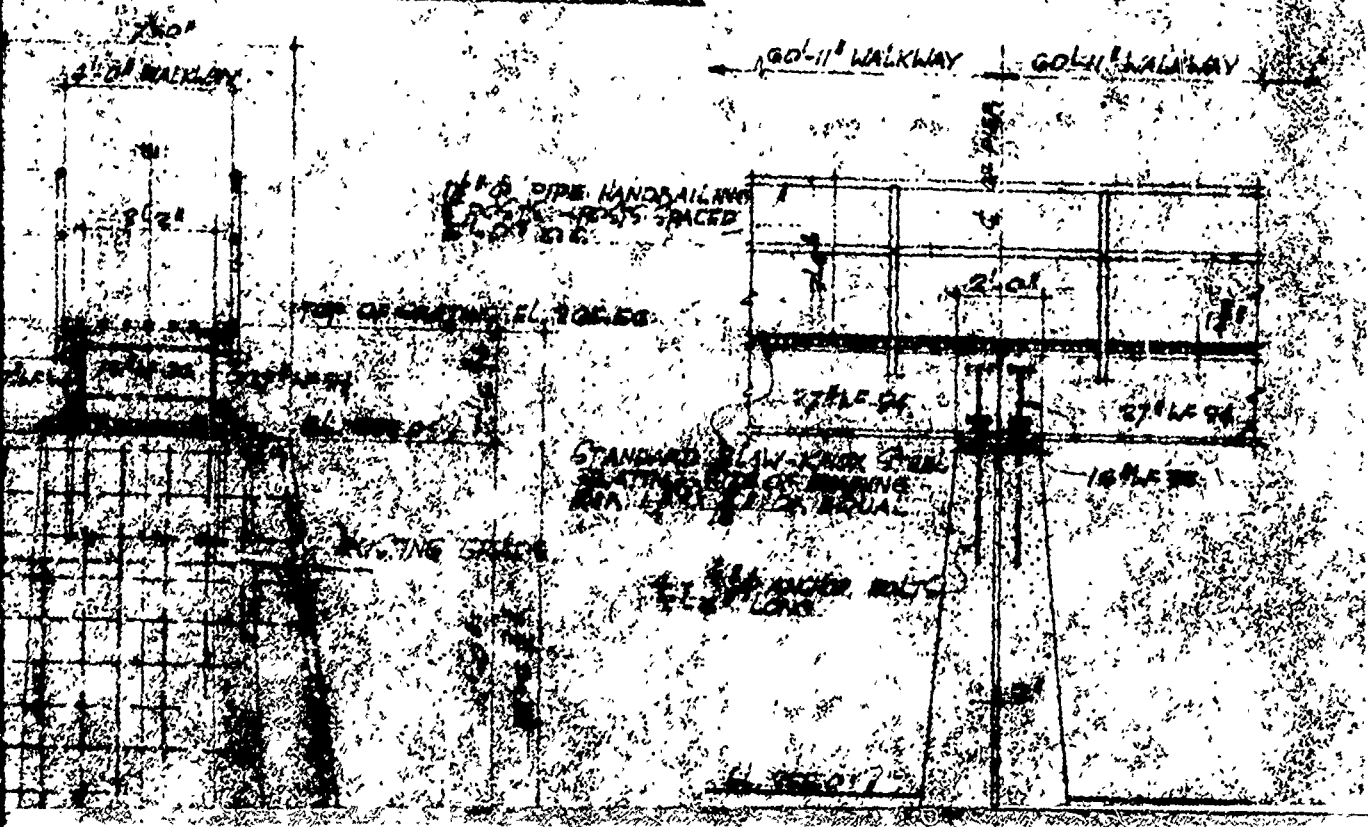
14" ϕ TIES 12" CT
14" ϕ VERT




1072

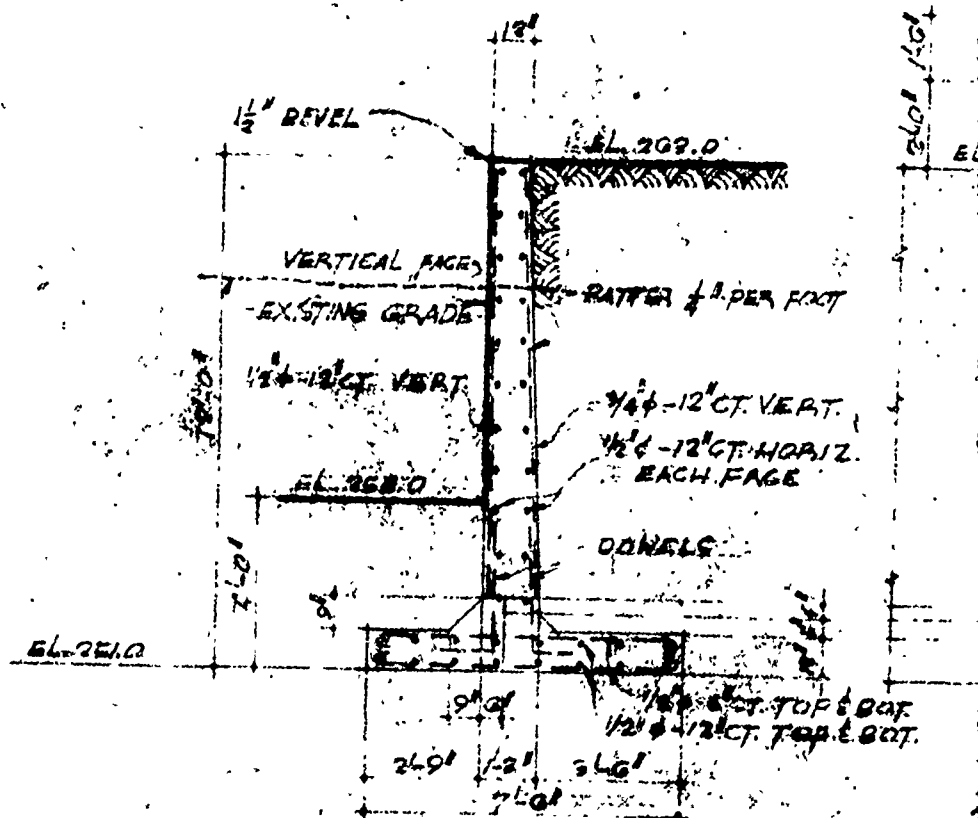
11-01 21-01 11-01 11-01 11-01

~~PIER WITH WALKWAY REMOVED~~

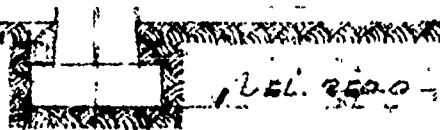




5



SECTION A-A

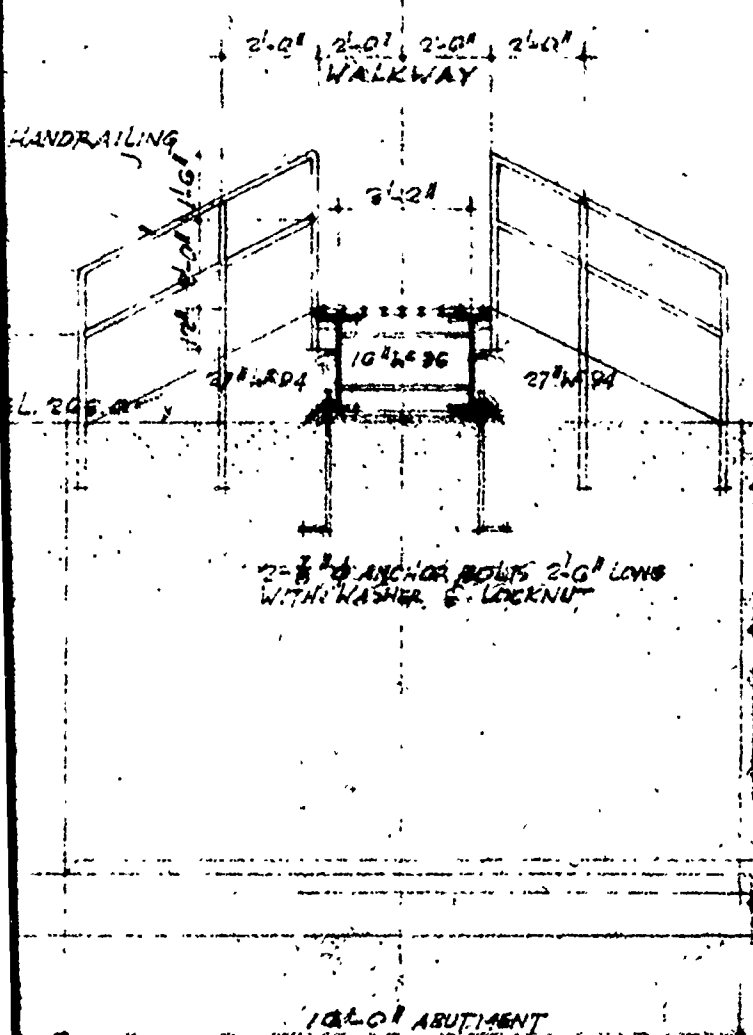


6'X6' - 4X#4 WIRE MESH

120'-0" SPILLWAY

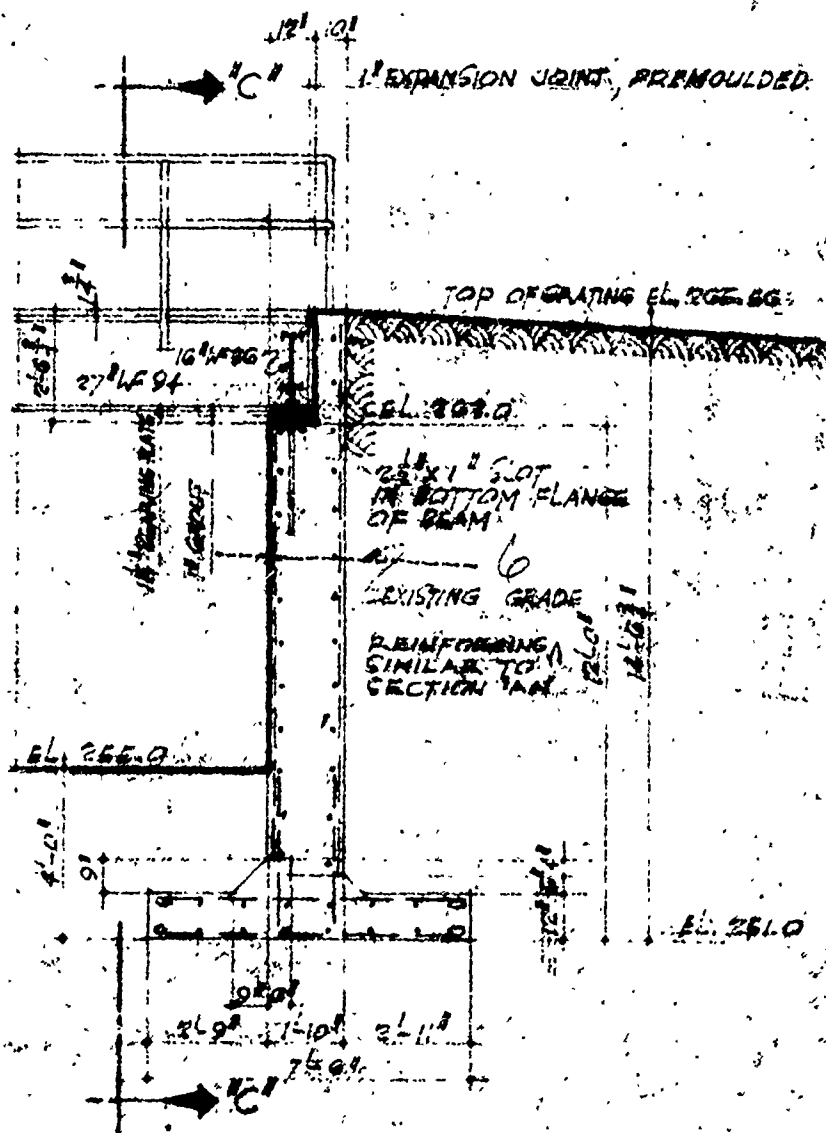
SECTIONAL ELEVATION

SCALE - $\frac{1}{8}" = 1'-0"$



SECTION 'C-C'

SCALE - $\frac{1}{4}" = 1'-0"$



SECTION 'B-B'

CORE WALL OF DAM

CORE WALL TO CLASH
FOOTING OF WALL

500'

20'

DOWN

11-25

DETAIL

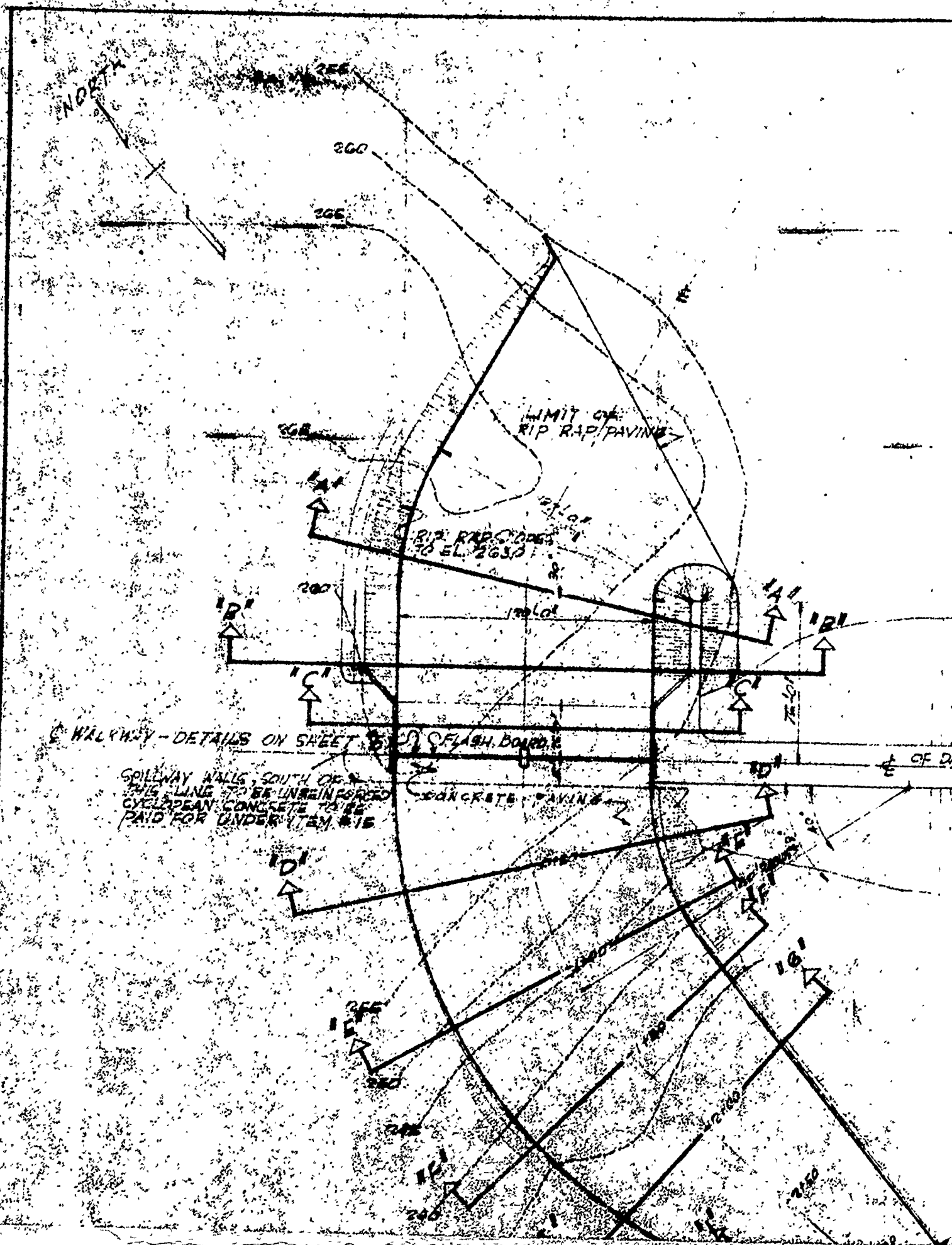
SCALE

71

DETAILS OF PIER

SCALE 1" = 1'-0"

LATHAM WATER DISTRICT		
ADDITIONAL WATER SUPPLY FROM STONY CREEK SARATOGA COUNTY N.Y.		
WALKWAY OVER SPILLWAY PLANS .. SECTIONS .. DETAILS SCALE AS NOTED		
NOVEMBER 1945	FRISBOLD CONSULTING ENGINEERS TROY, NEW YORK	SHEET 5 10



2

RIP RAP

RIP RAP

STONY CREEK

CONCRETE PAVING

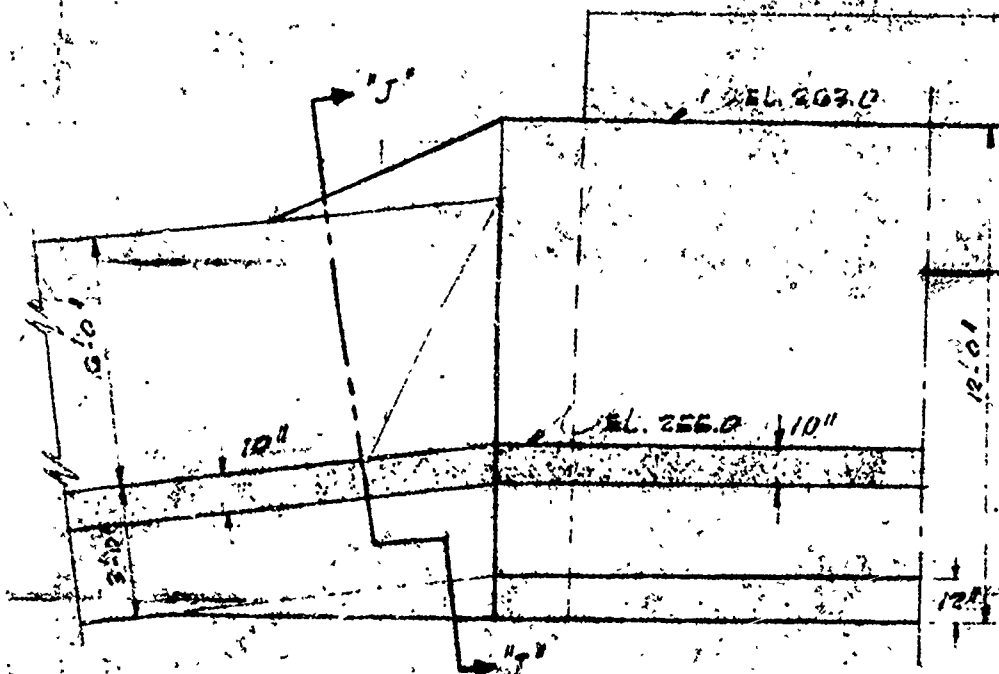
CONCRETE PAVING

61

100' RADIUS

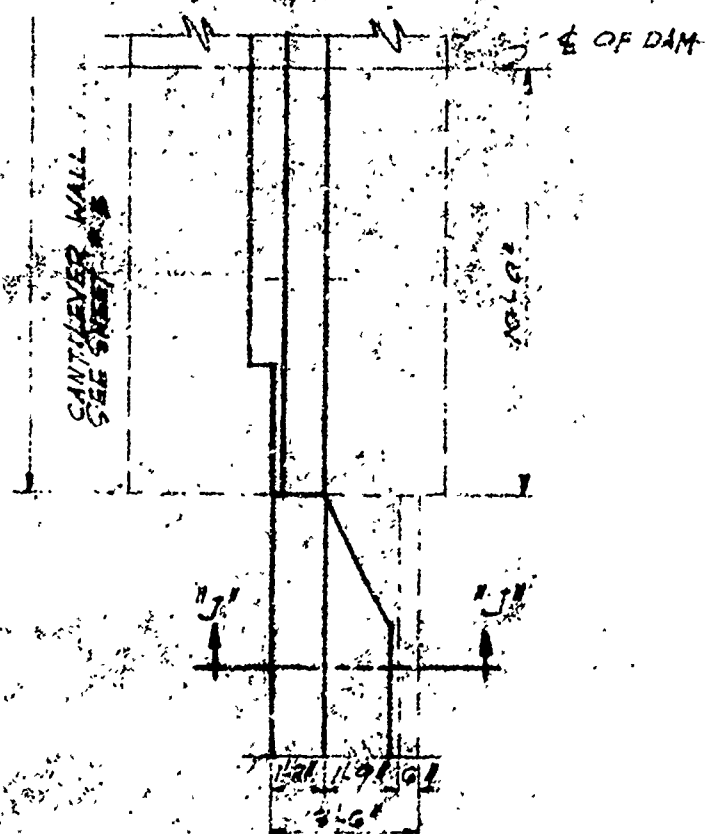
Fig. 1

4



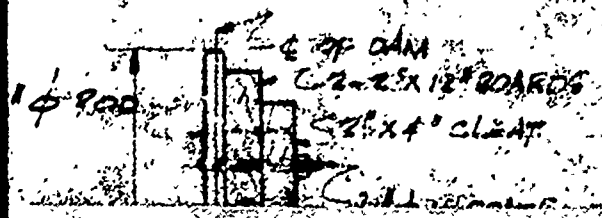
SECTIONAL ELEVATION

WALL TO BE IN 40' SCALE $\frac{1}{4"} = 1'-0"$
 SECTIONS WITH KEY
 AS SHOWN IN TEMPERATURE
 SCALE TO LAP 12'



PLAN

JUNCTION OF GRAVITY



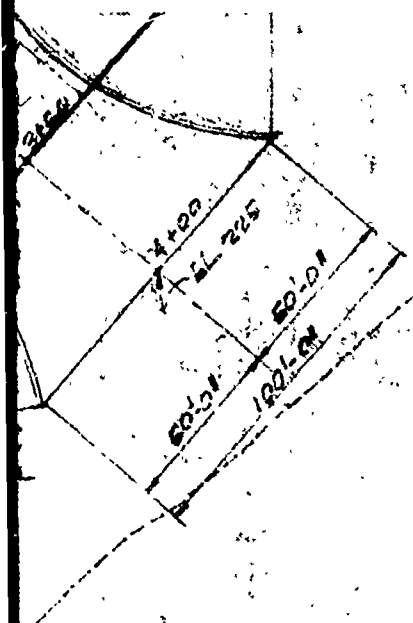
PLAN OF SP
C.C. E. I. A

250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0

BOTTOM OF

PROFILE ON E. OF

SCALE: HORIZONTAL
VERTICAL



CONCRETE PAVING

CONCRETE PAVING

SPILLWAY

50'

EXISTING GRADE

SPILLWAY

1+00 1+50 2+00 2+50 3+00 3+50 4+00 4+50

SPILLWAY

AL 12-50
12-50

FO

SECTION 'E-E'

SECTION 'F-F'

SECTION 'G-G'

SECTION 'H-H'

1/2" EXTRA STRONG
PIPE SOCKET
EL. 255.0 BOTTOM OF SPILLWAY

CONCRETE APRON

DETAIL OF POST FOR FLA

SECTION
SHOWN ABOVE

2" x 4" CLEAT

1" Ø U BOLT ENDS

15" x 15"

SECTION SHOWN ABOVE

TYPICAL DETAIL OF

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

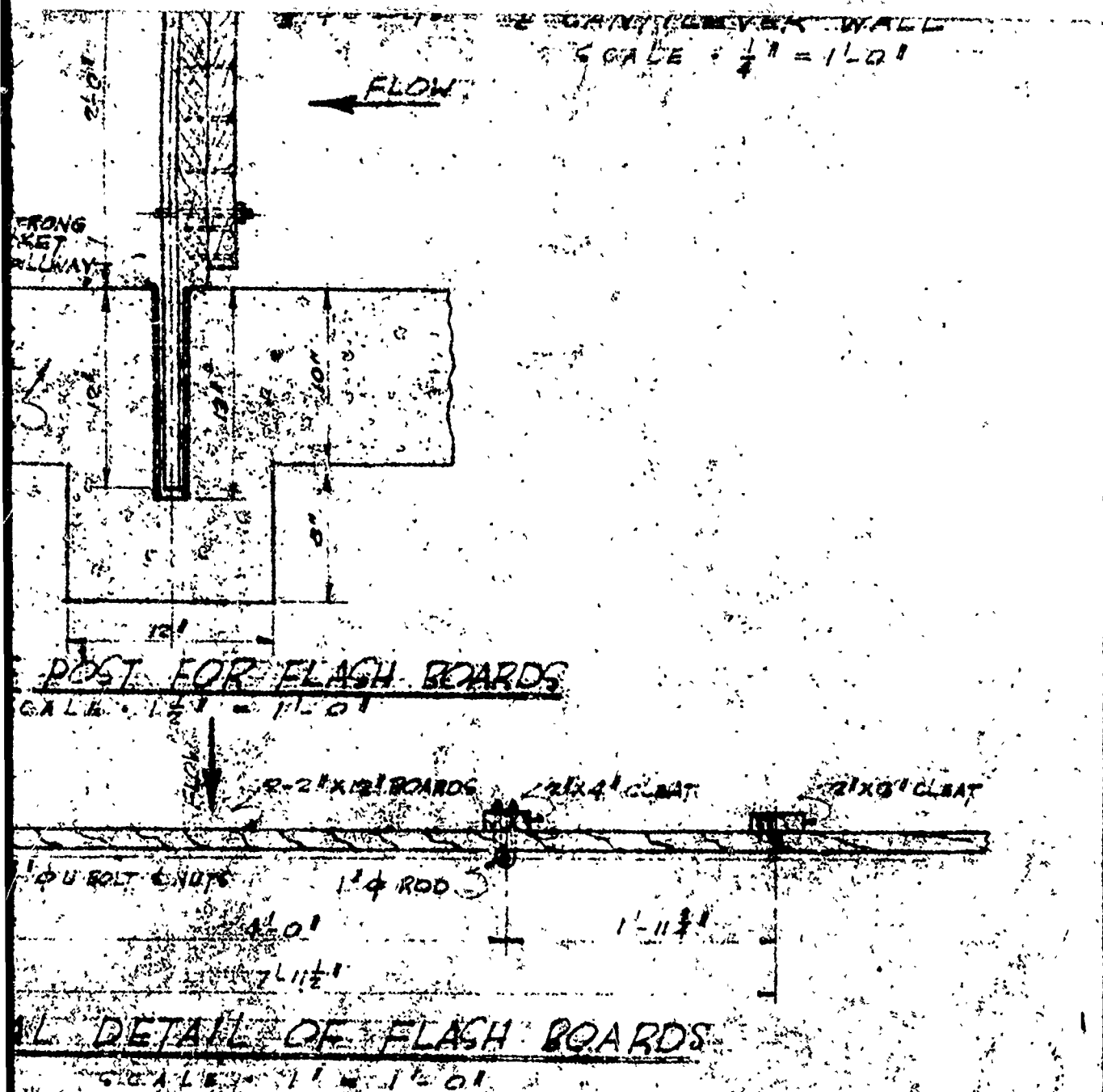
SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"

SCALE 1" = 1'-0"



LATHAM WATER DISTRICT		
ADDITIONAL WATER SUPPLY FROM STONY CREEK SARATOGA COUNTY, N.Y.		
PROPOSED SPILLWAY PLAN SECTIONS PROFILE SCALE AS NOTED		
ENGINEER	KEIS & HALROYD CONSULTING ENGINEERS TROY, NEW YORK	SHEET
1940		6 OF 10

4'-0" WIDE SWING DOOR
COMPLETE WITH PADLOCK

1 1/2" PIPE HAND RAILING

1 1/2" GRATING

24" I. B.B.
FOR DETAIL SEE
SECTION B-B

FOOT. RAIL
SEE DETAIL

1" DRAIN PLUG
FOR BONNET

3 STRANDS BARBED WIRE

CYCLONE FENCE OR EQUAL

FLOOR STANDS WITH ENCLOSED
LEVEL GEARING, SUITABLE FOR
VALVES SHOWN

EL. 253.0

VERT.
LADDER
STRINGERS
3" DIA.

12'-0" CT. EACH
WAY ALT. BENT

SMALL BALL
TRUSS, 2" DIA.
TOP TOE BOLT

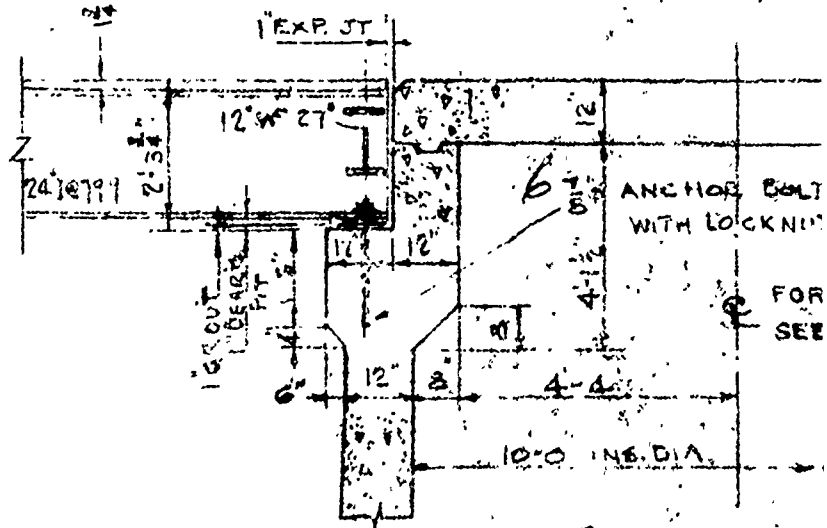
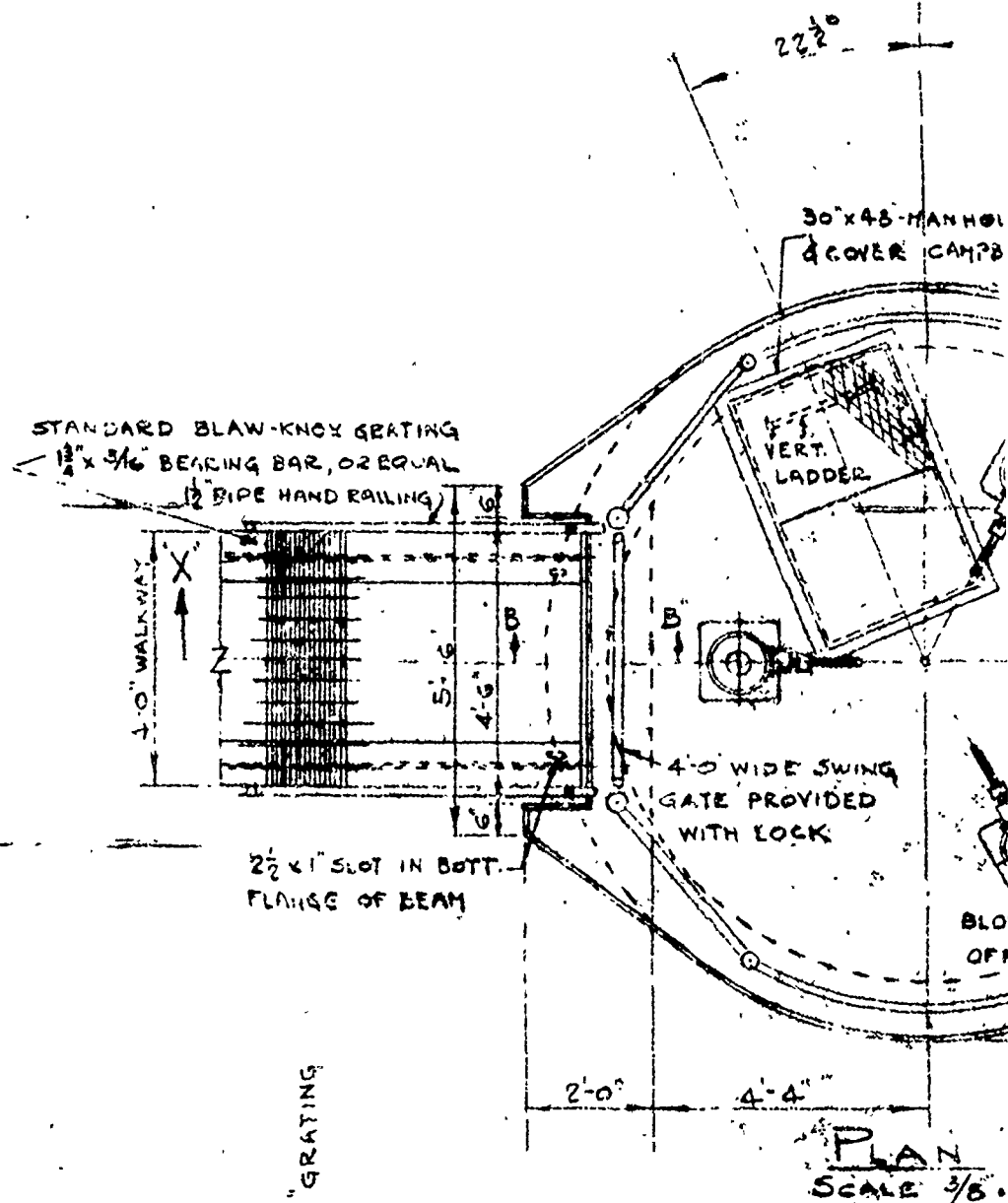
WATER LEVEL OF DAM 255.0

24" GATE
VALVE

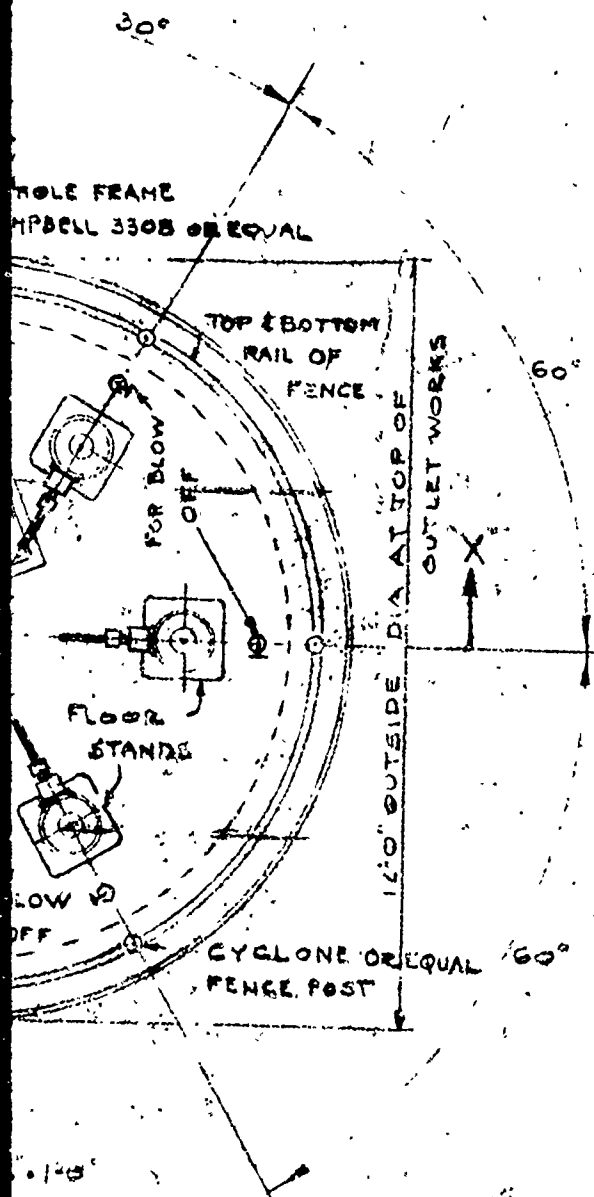
24" GATE VALVE EL. 250.0

1'-0" CT.
FLOOR

21



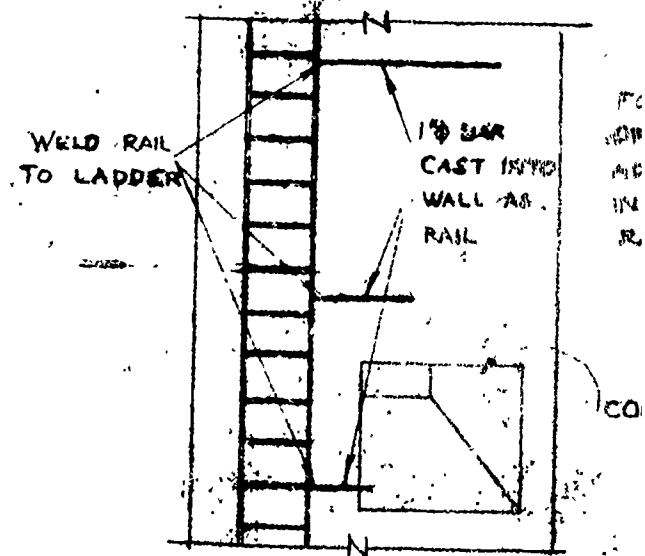
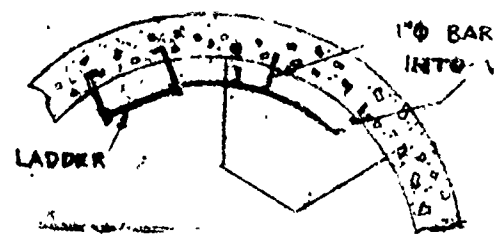
SECTION E
SCALE 3/8"



ATS 2'0" LG
UT & WATHER

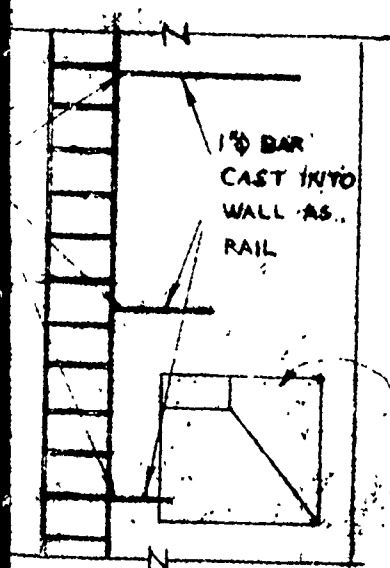
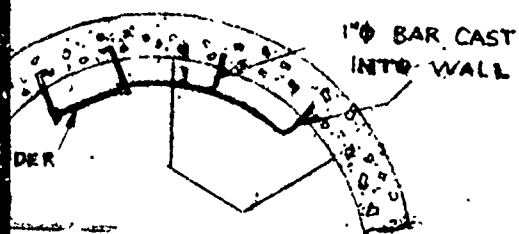
REINFORCING
SECTION XX.

B-B



TYPICAL DETAIL
OF FOOT RAIL

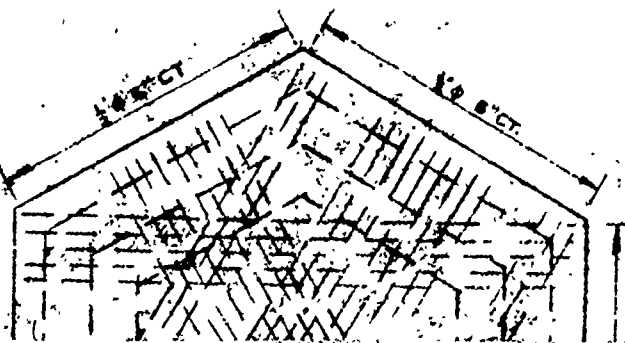
4



FOR LONG LENGTHS
OF RAIL CAST
ADDITIONAL SUPPORTS
IN WALL & WELD TO
RAIL



TYPICAL DETAIL
OF FOOT RAIL



2230

48'-0"

20'-9 1/2" FOOTING

14'-0" OUTSIDE DIA AT BOTTOM

10'-0" INSIDE DIA

30" C.I. PIPE TO
WATER
TREATMENT
PLANT

C.I. WALL SLEEVE
18" MAX

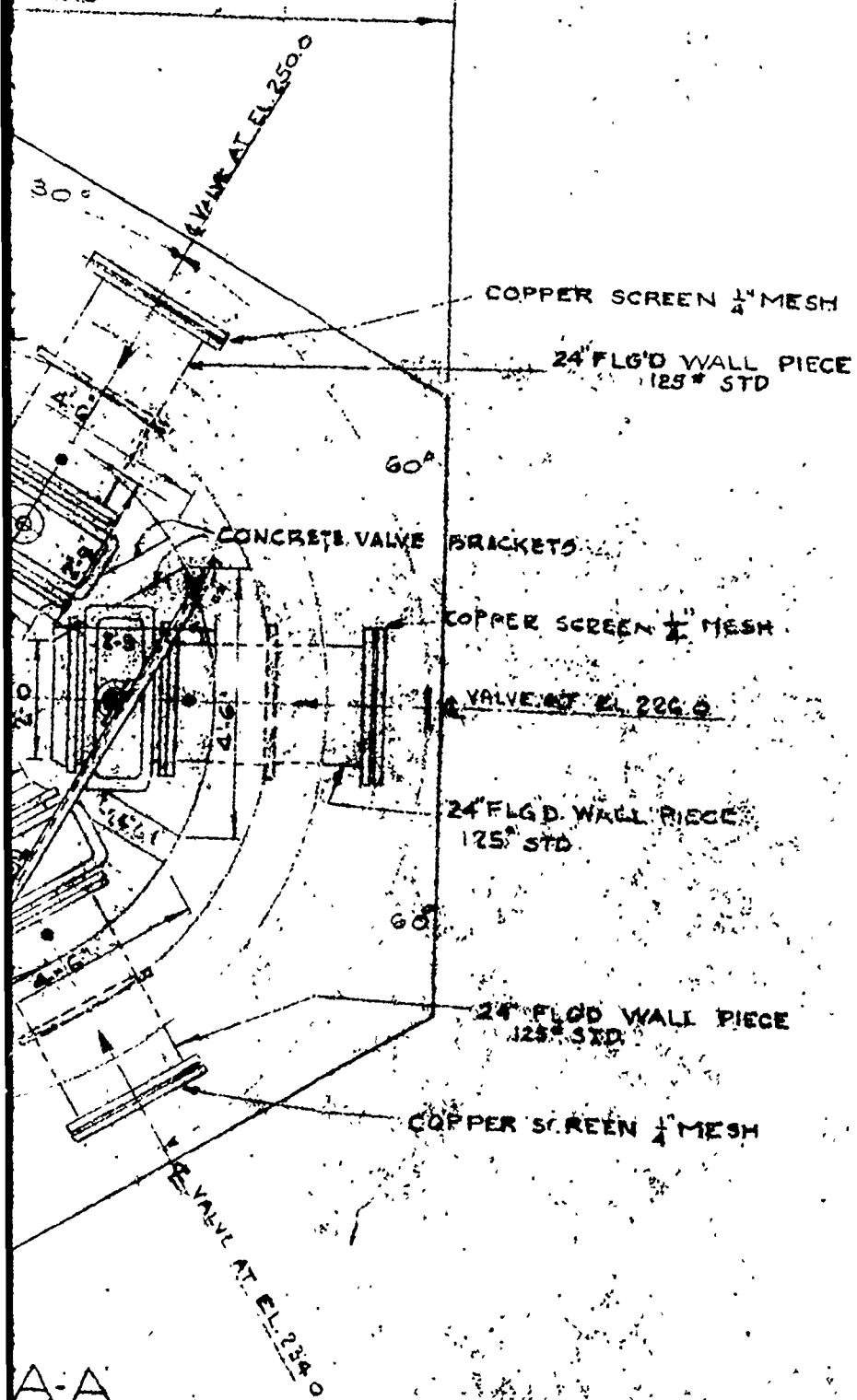
GUIDES FOR
EXTENSION
ROD OF VALVE
24' 6"

SECTION

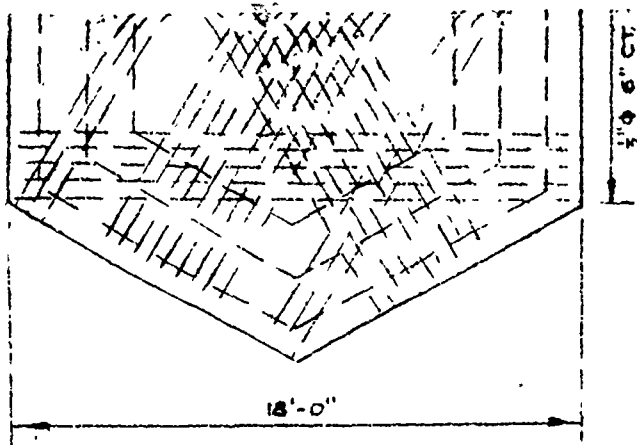
SCALE 3/8" = 1'

10

NOTING



NOT
3 REI
STEE
WALL



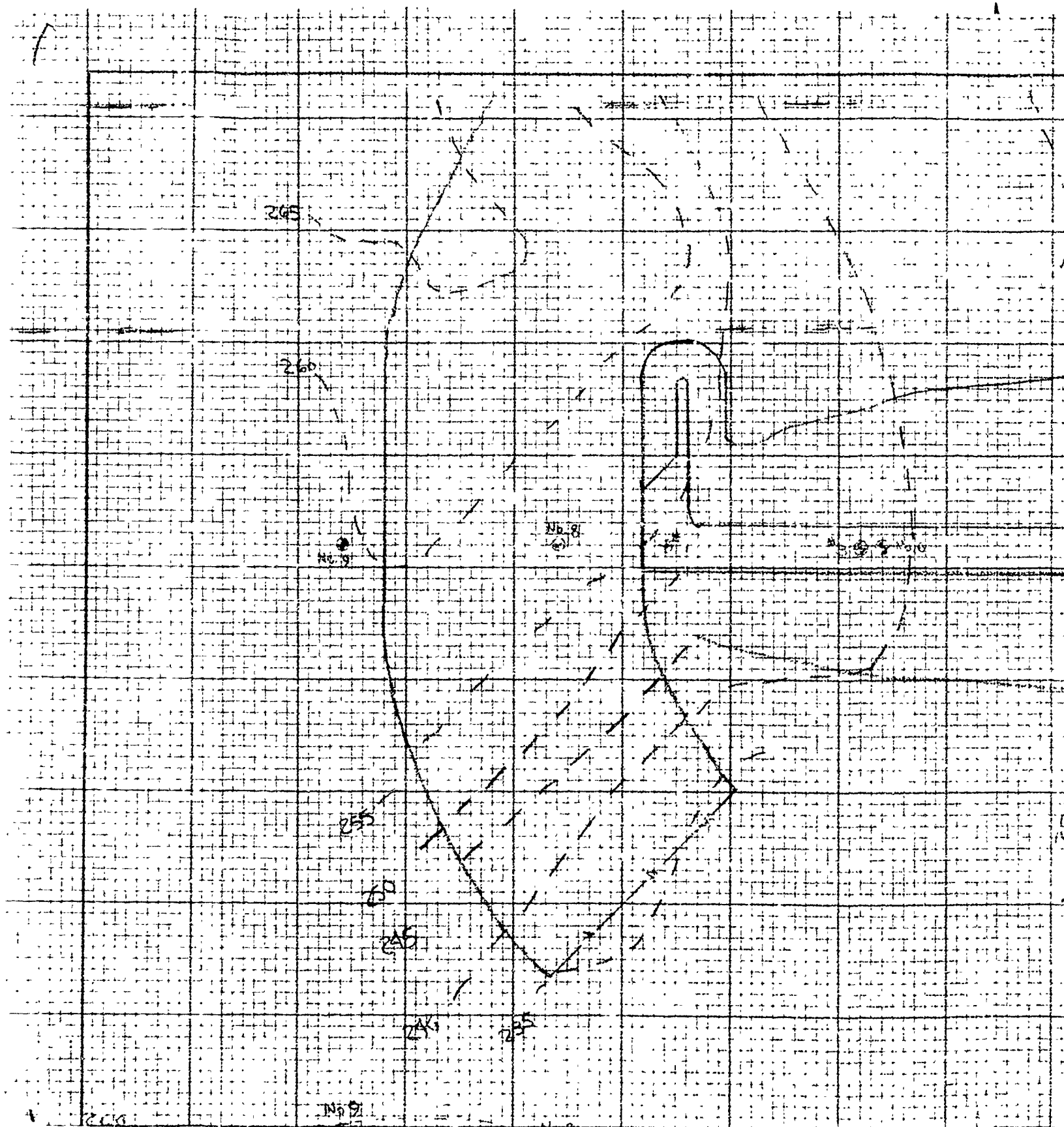
ARRANGEMENT OF REINFORCING
STEEL IN FOOTING

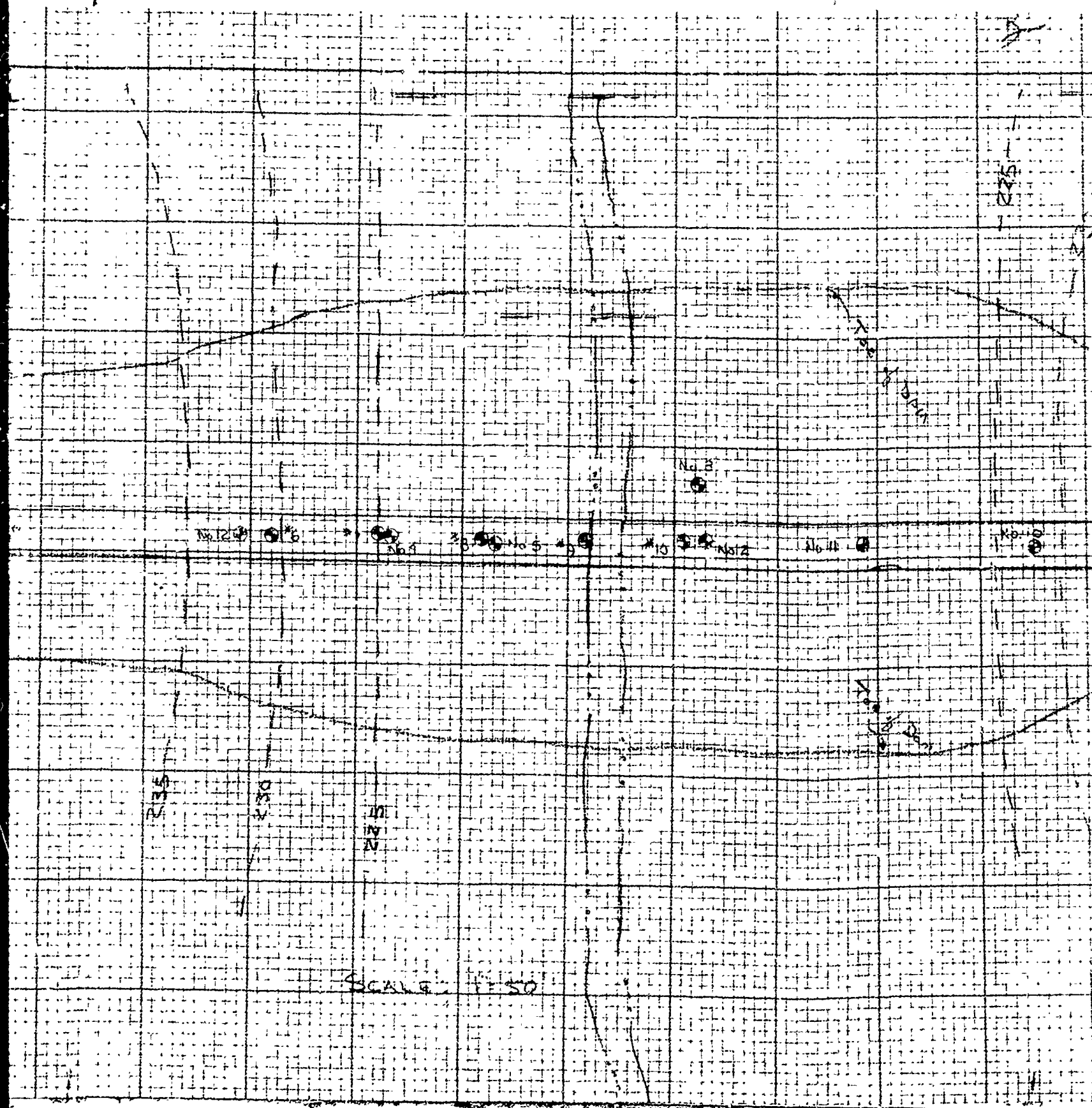
SCALE $\frac{3}{16}$ " = 1'-0"

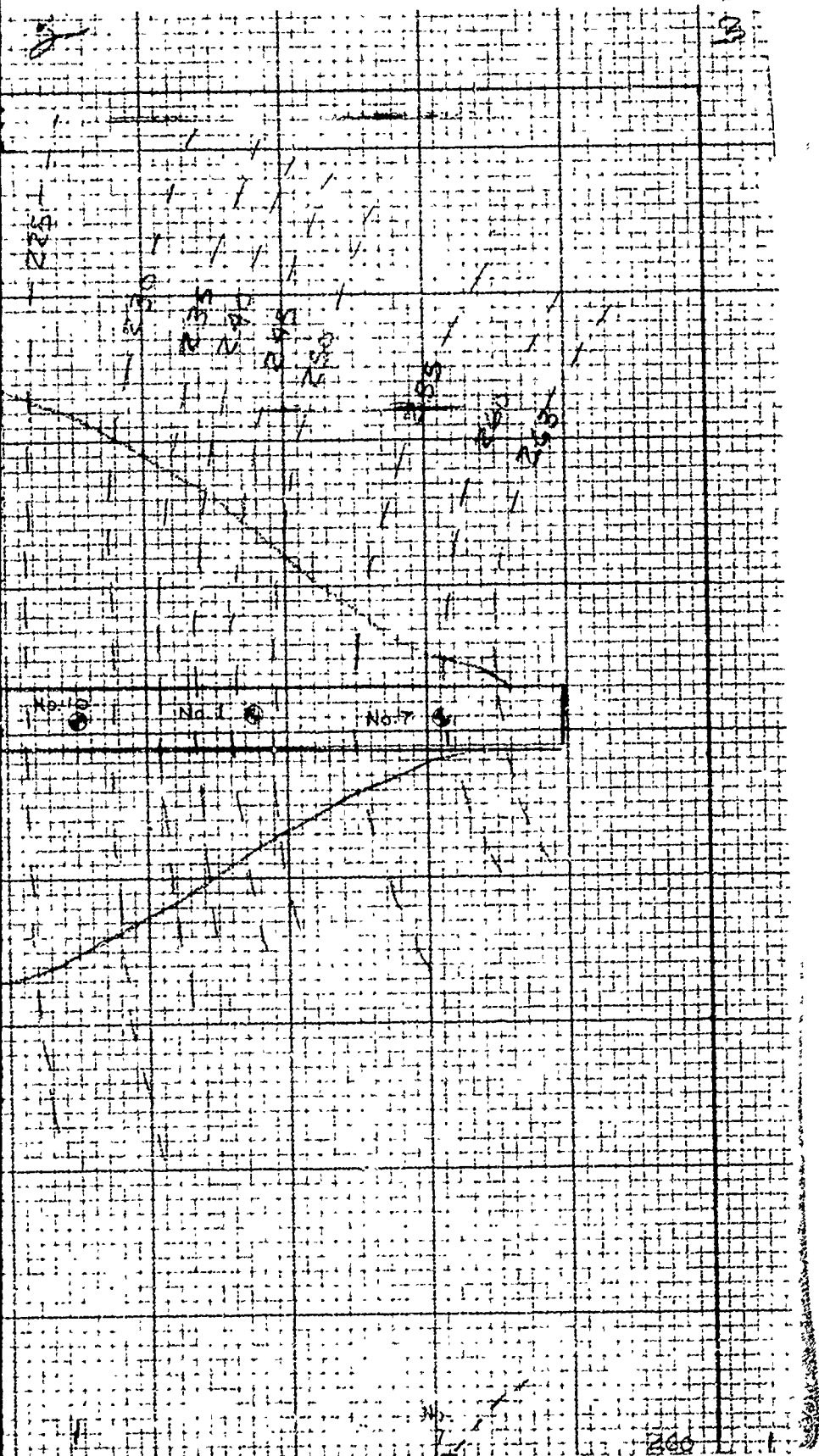
NOTE

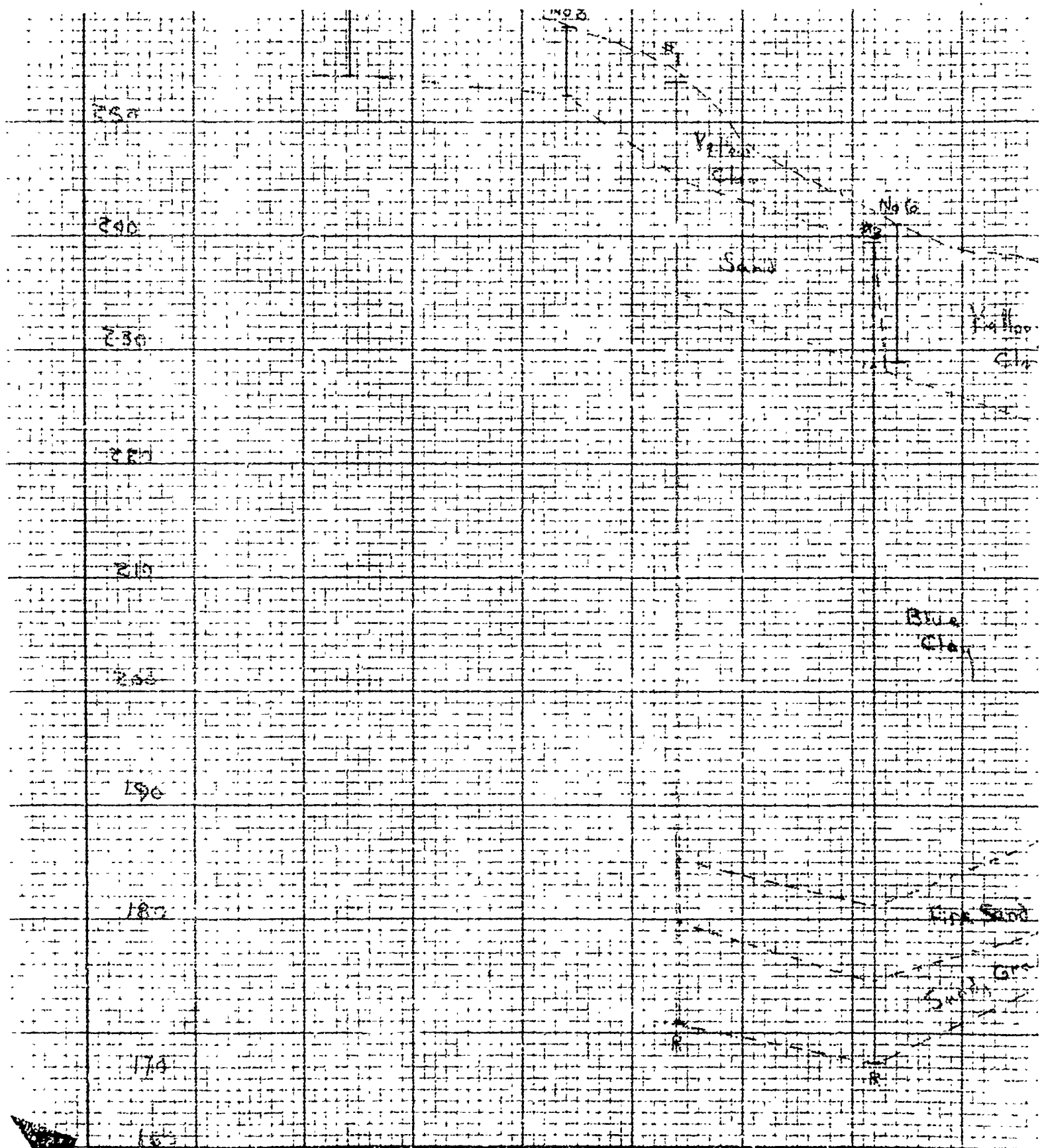
3 REINFORCING BARS SAME SIZE AS WALL
STEEL TO BE PLACED CONCENTRIC WITH
WALL PIPE AT EACH OPENING

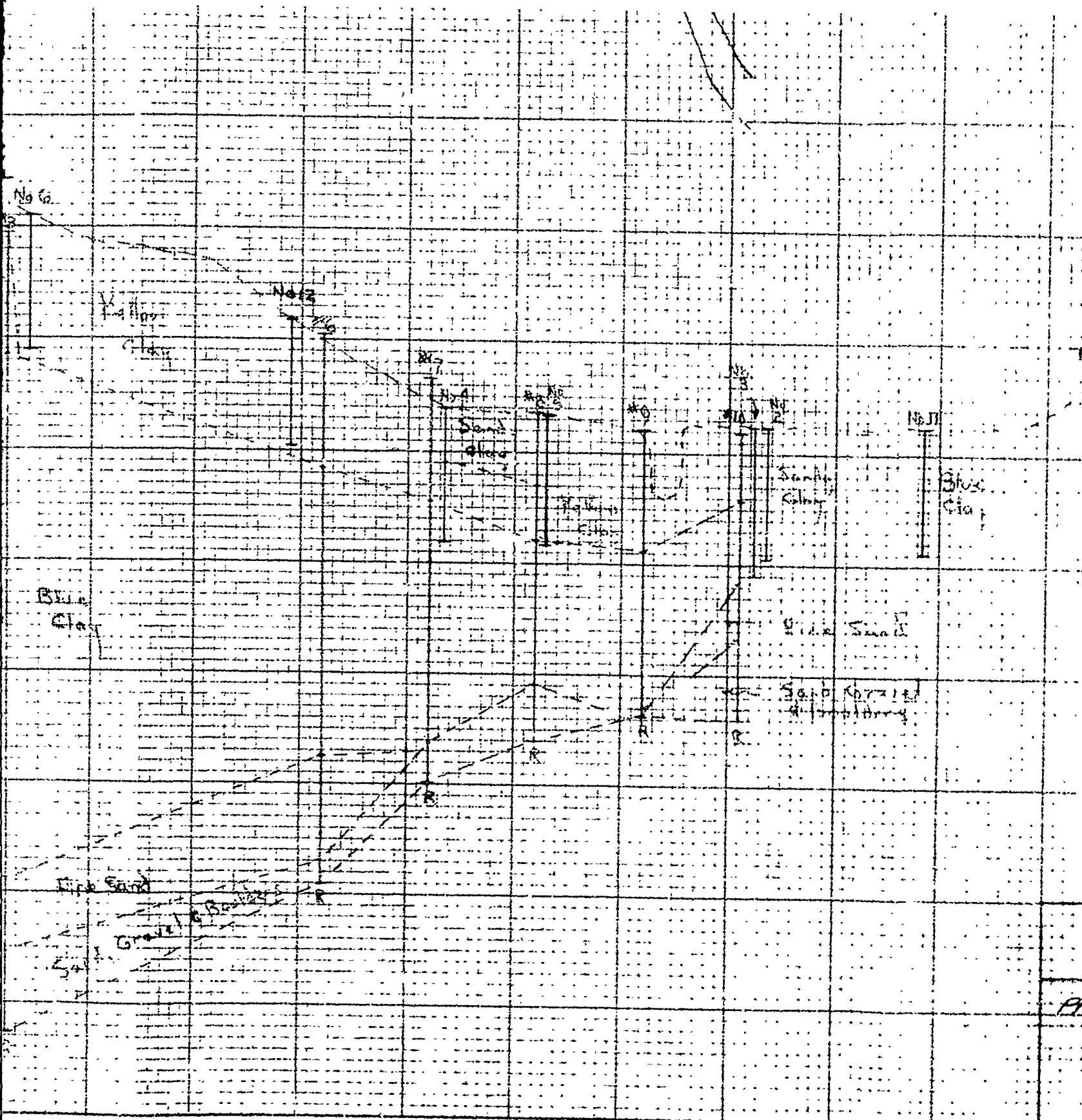
LATHAM WATER DISTRICT		
ADDITIONAL WATER SUPPLY FROM STONY CREEK SARATOGA COUNTY N. Y.		
OUTLET WORKS PLANS " SECTIONS " DETAILS SCALE AS NOTED		
NOVEMBER 1949	KEIS & HOLROYD CONSULTING ENGINEERS TROY, NEW YORK <i>F. J. Keis</i>	SHEET 4 OF 40

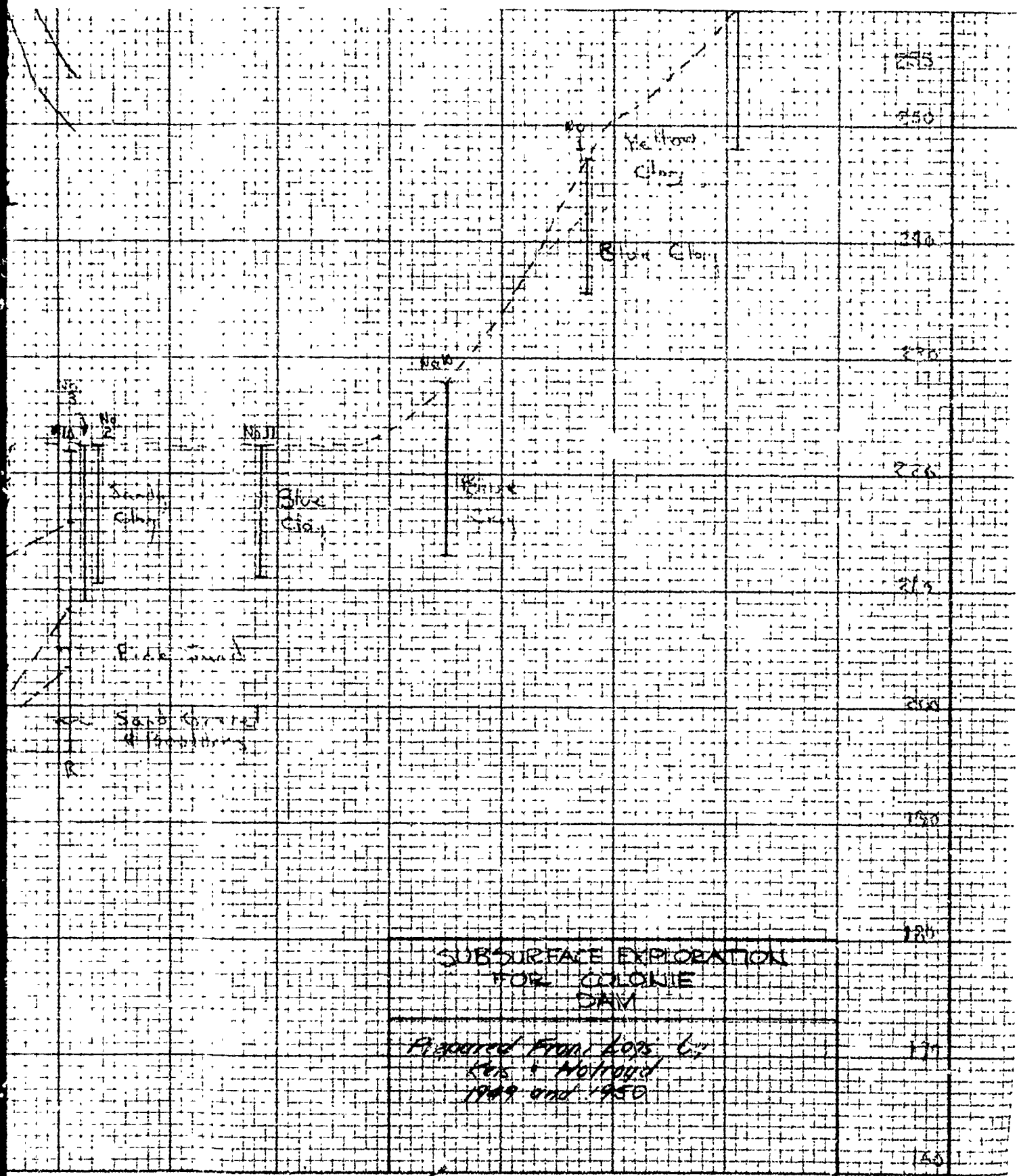






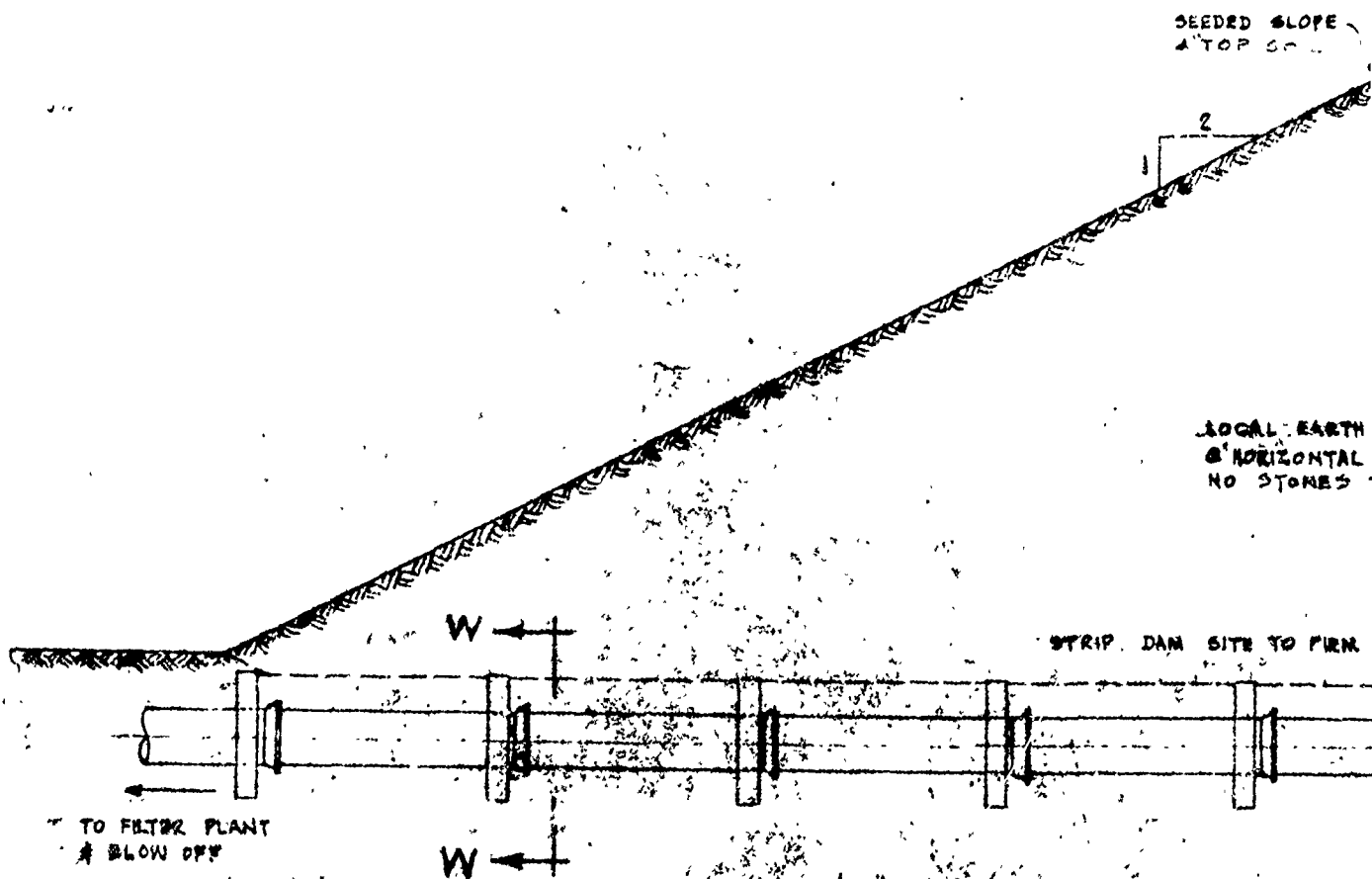






311

62



SECTION "W.W"

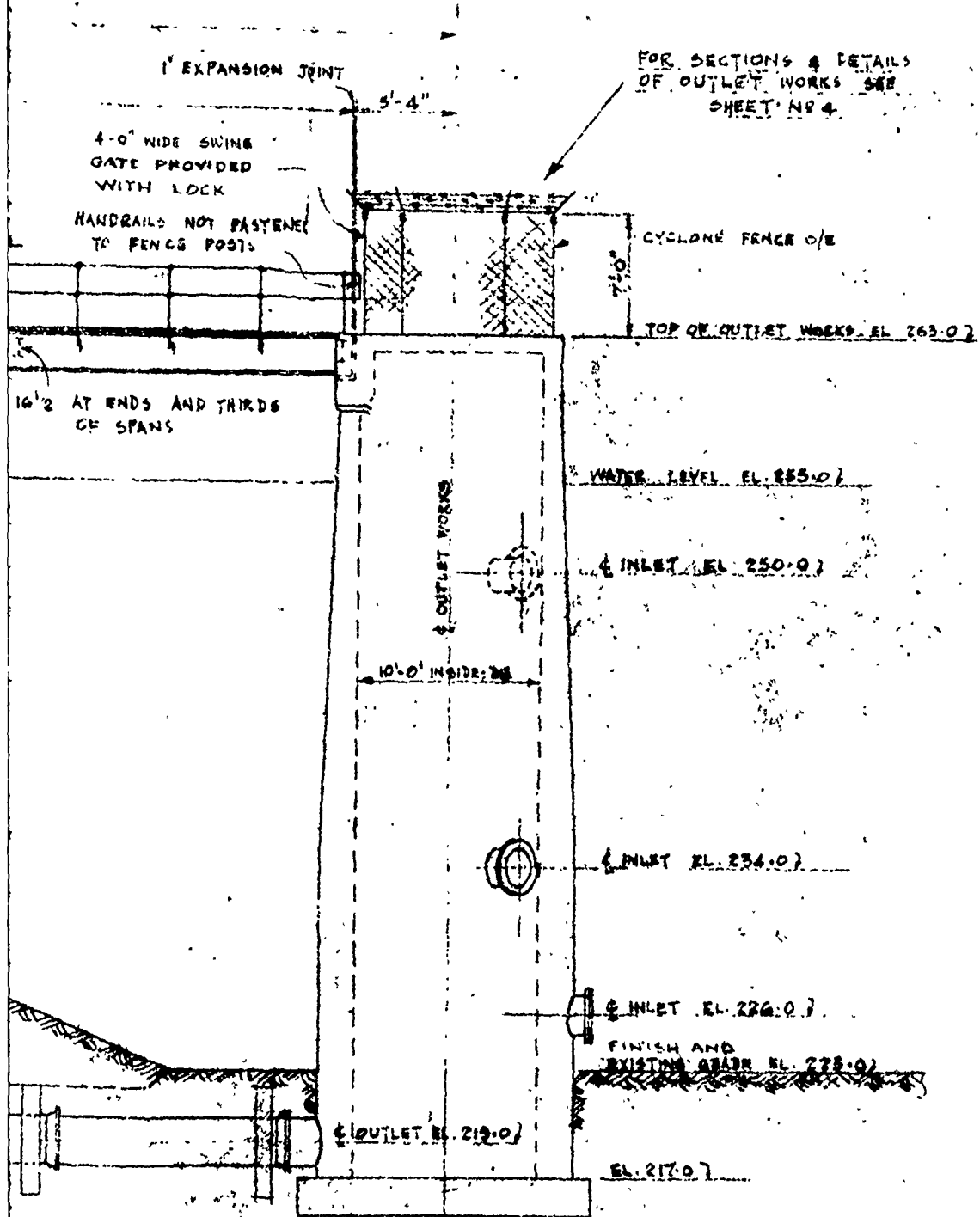
1/2" PIPE HANDRAILING & POSTS

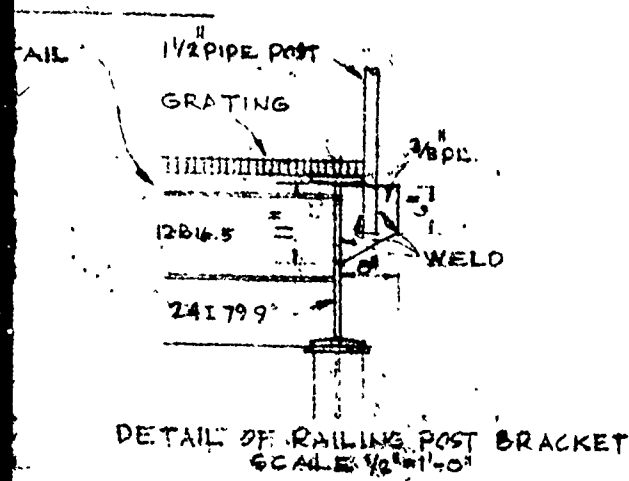
WALKWAY

STANDARD SLAM-KAY
STEEL BRACING SYSTEM

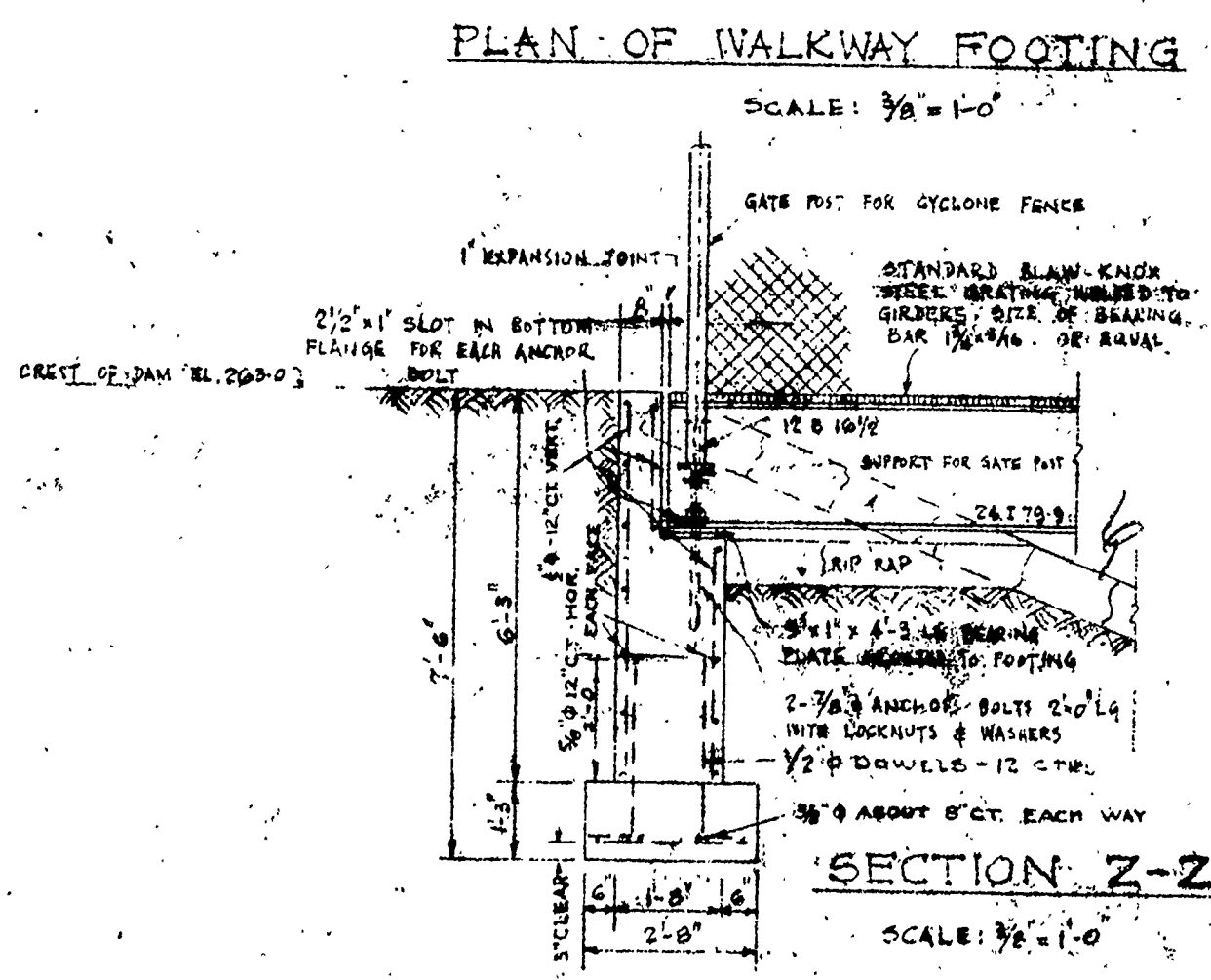
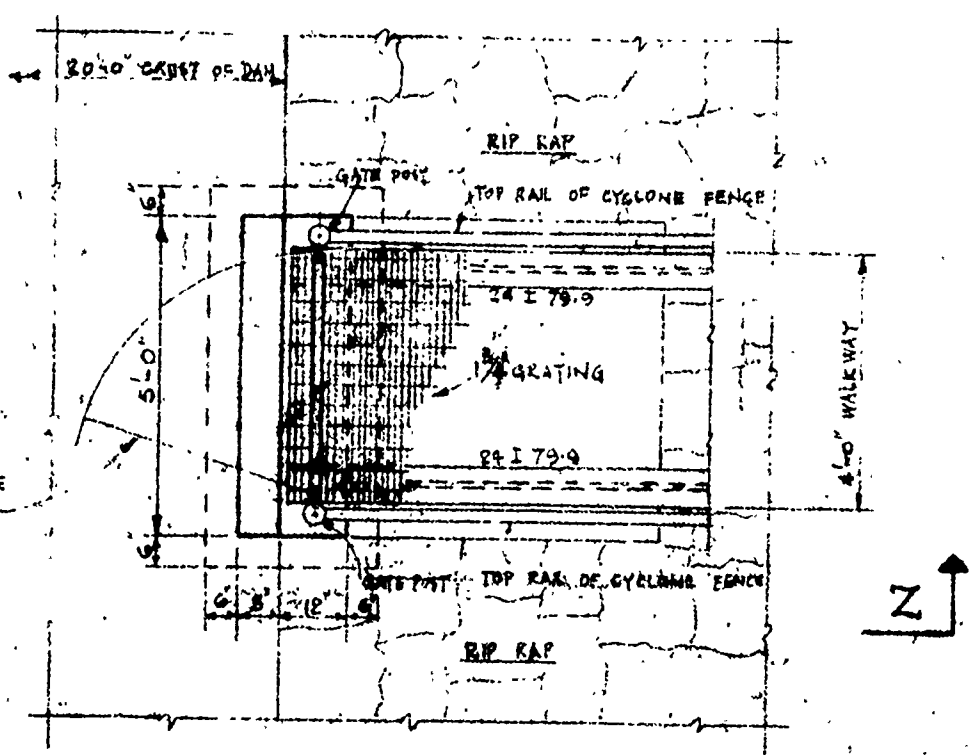
as "B"

4.

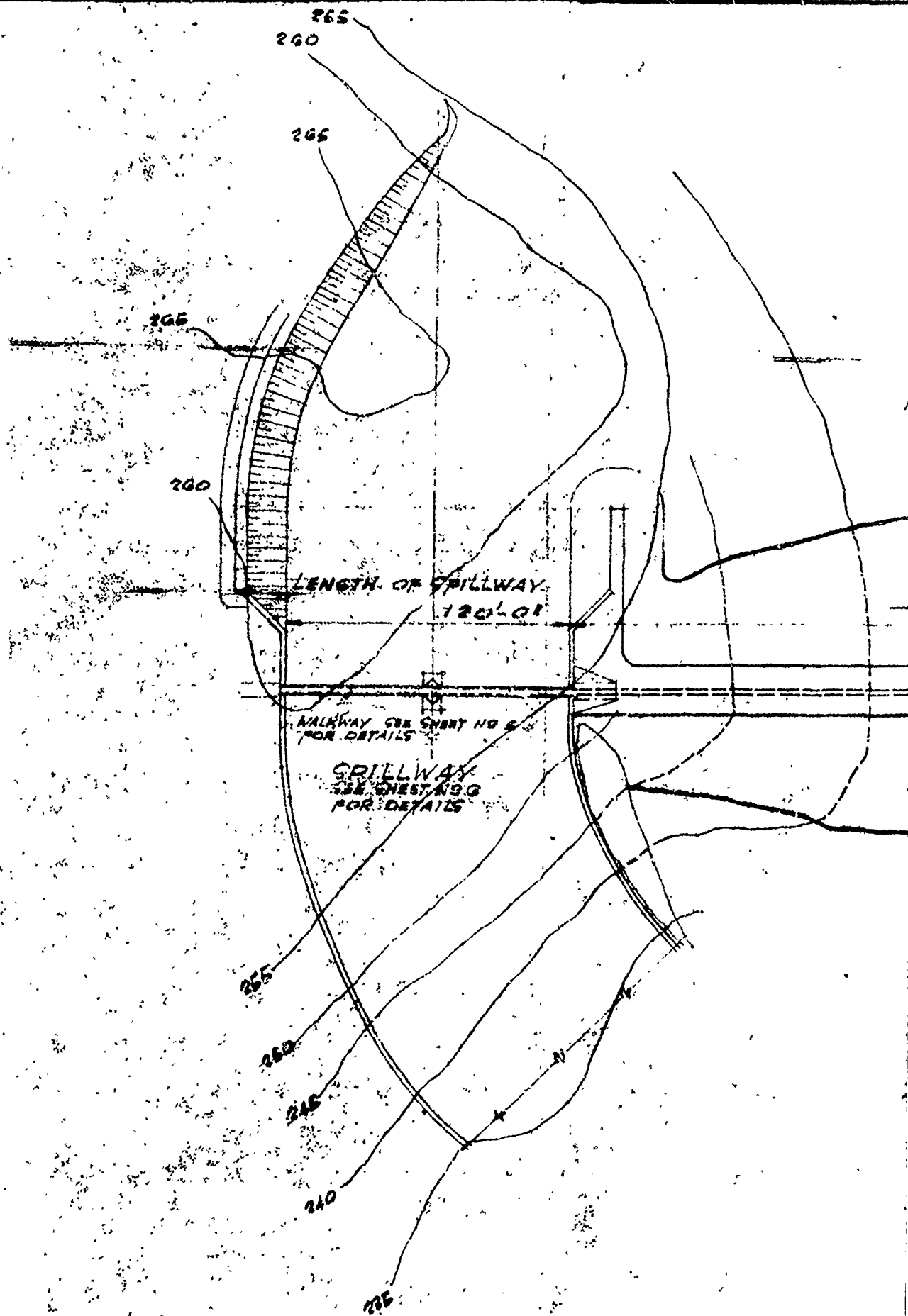




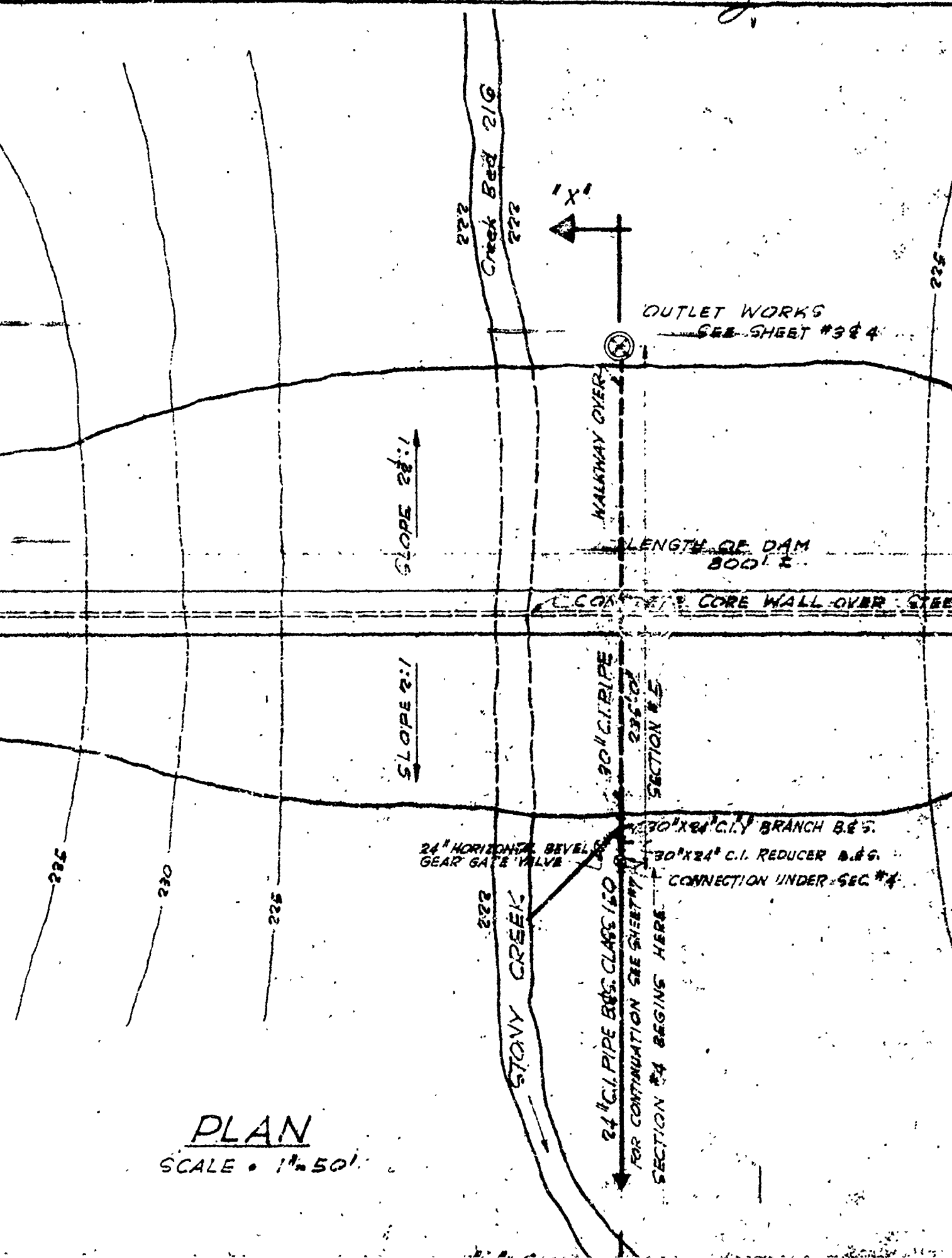
4'-0" WIDE SWING GATE
PROVIDED WITH LOCK



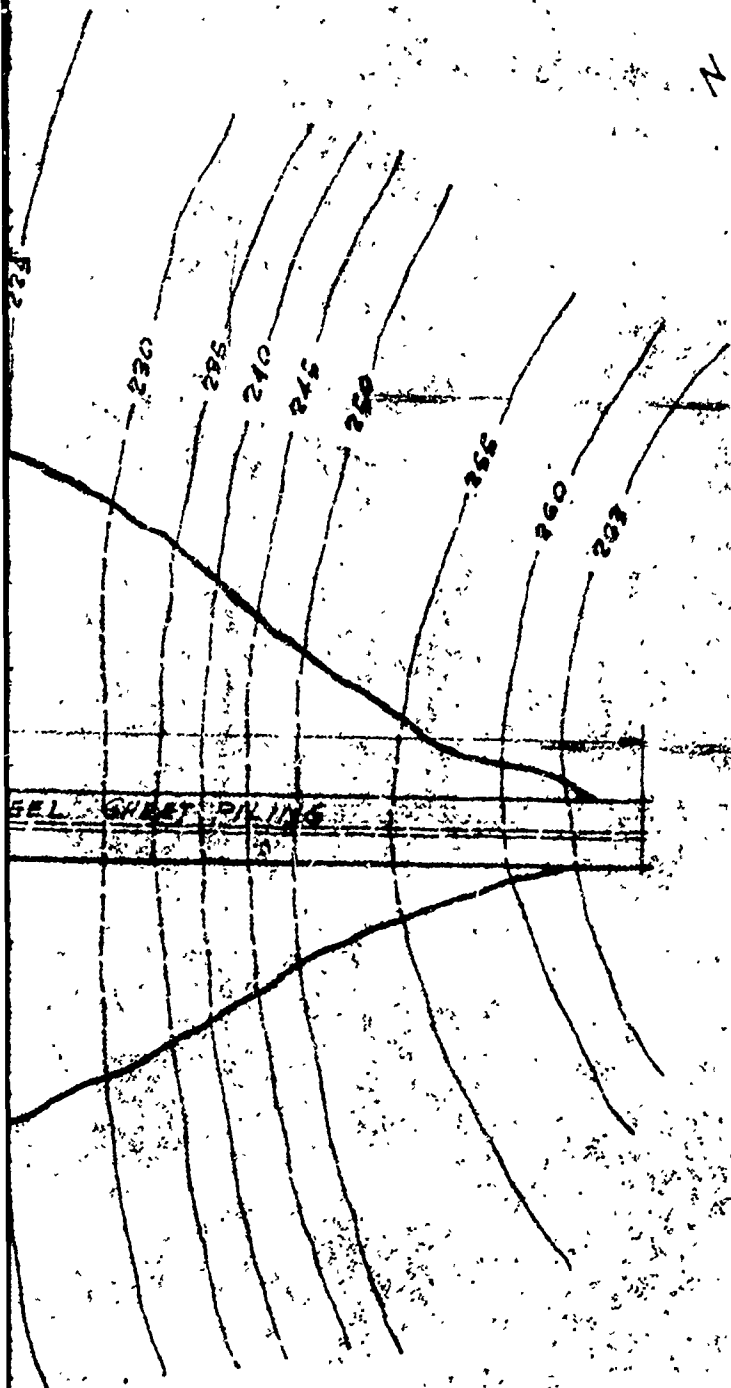
LATHAM WATER DISTRICT		
ADDITIONAL WATER SUPPLY FROM STONY CREEK SARATOGA COUNTY N. Y.		
SECTION & DETAILS OF DAM		
SCALE AS NOTED		
NOVEMBER 1945	KEIS & HOLROYD CONSULTING ENGINEERS TROY, NEW YORK <i>F. J. Keis</i>	SHEET 3 OF 40



2.



PLAN
SCALE • 1" = 50'



N

EEL CREEK DRIVING

[illegible]

27 MAY 1964

EL. BOTTOM OF
RAILWAY AT 255.0'

57. 28A. 9

ELBERT, C.

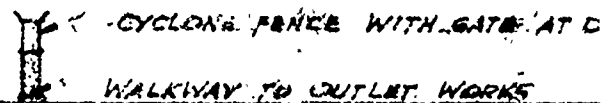
1997

34,235.0

EXCAVATE FOR 80T
FOOTINGS TO IMPRV
STEEL

STEEL
SHEET

OF MINIMUM
CORE W



✓ TOP OF CORE WALL 200.0

STEELE AND

EXCAVATE INTO IM
FOR BOTTOM OF

1507

EXISTING GROUND

3046.1 PIPE

44-3780

20'-0"
 20'-0"
 20'-0"
 20'-0"
 20'-0"
 FORM
 CORR. WALL
 PI

PILING

BELOW BOTTOM
ALL FOOTING

70455A

52:207.6

756405

40107

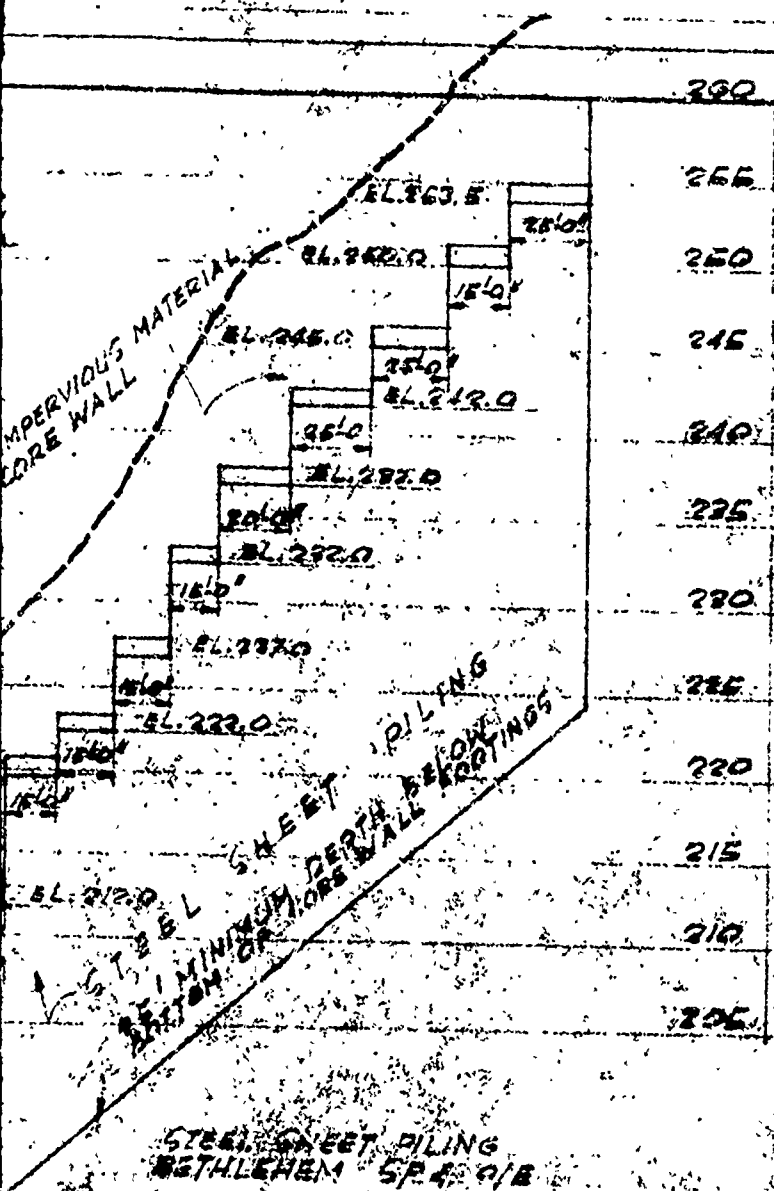
SHEET PILING
EXTEND TO SHALE

PROFILE ON \angle OF DAM

SCA' 202

HORIZ: 1" = 50'
VERT: 1" = 10'

DAM



4" x 8" KEY

IMPERVIOUS MATERIAL

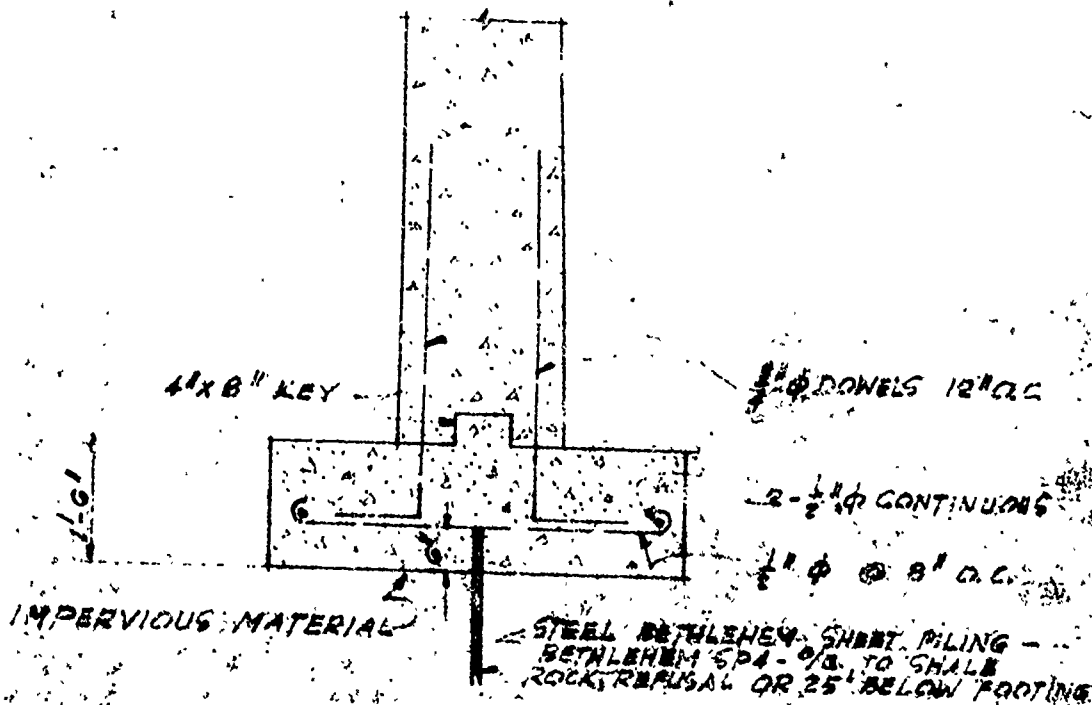
SECTION

SCALE

REVISED APRIL 17, 1950

NOV

19



SECTION THROUGH FOOTING

SCALE: $\frac{1}{2}" = 1'0"$

LATHAM WATER DISTRICT		
ADDITIONAL WATER SUPPLY FROM STONY CREEK SARATOGA COUNTY, N.Y.		
PLAN AND PROFILE OF DAM SCALE AS NOTED		
NOVEMBER 1949	KEIS & HOLROYD CONSULTING ENGINEERS TROY, NEW YORK <i>F. J. Keis</i>	SHEET 2 OF 10

APPENDIX A

b. List of Drawings Included for the Phase i Investigation of Colonie Dam

<u>Drawings</u>	<u>Drawing No.</u>
Plan and Profile of DAM	2 of 40
Sections & Details of DAM	3 of 40
Outlet Works Plans, Sections, Details	4 of 40
Walkway Over Spillway Plans, Sections, Details	5 of 40
Proposed Spillway Plans, Sections, Profile	6 of 40
Subsurface Exploration for Colonie DAM	---

Log of Boring. Hole "A"

Proposed Stony Creek Dam, Clifton Park, NY

Location on hole. 6 feet East of creek on Axis.

Elevation top of ground. 220' Date 8.45 AM 2/4/50

- 1 Surface
- 2 Top soil
- 3 Soft sand and shale
- 4
- 5
- 6
- 7
- 8
- 9 Quick sand
- 10
- 11 Coarse sand and soft shale
- 12
- 13
- 14
- 15
- 16
17. Top of hard pan. Feels like a gravel encrusted shale.

Claude S. Young.

Log of Hole "1.A"

Proposed Stony Creek Dam. Clifton Park. NY

Location of Hole. 100 feet West of Hole "A" This hole on the west side of creek.

Elev. 220 top of hole. Date 3.30 PM 2 / 4/50.

1. Surface soil
- 2
- 3
- 4
- 5
- 6 Brown shale soft.
- 7
- 8
- 9
- 10
- 11 Brown Shale streak of sand
- 12
- 13
- 14
- 15.7 Top of hardpan. A gravely hard shale.

Note. Water standing 10" from top of hole.

Claude S. Young.

Log of Hole "2.A"

Proposed Stony Creek Dam. Clifton Park. NY

Location of hole. 100 feet West of Hole "1A"

Elev top of hole 222.6. Date 4 PM 2/4/50

1. Surface.

2

3

4

5 Soft brown plastic shale

6 Shale

7 very soft platy shale with sand lenses and water

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24. Quit in soft plastic shale 5.30 PM

25 Picked up hole at 11.20 AM 2/5/50

26 Soft dark brown shale

27

28

29

30 Water sand and shale soft

31

32

32.6 Top of hardpan. A gravely hard shale.

Claude S. Young.

Log of Hole "3A"

Proposed Stony Creek Dam, Clifton Park, NY

Location of hole. 100 feet west of Hole "2A" on Axis.

Elev top of hole 230.1 Date 2/5/50

1 Surface

2

3

4 Sandy shale

5

6

7 Soft brown shale, drills like cheese

8

9

10

11

12

13

14 Water rose to 18" from surface.

15 Sandy brown shale

16

17

18

19

20

21

22

23

24

25 very soft streak with water, very fine round sand.

26

27 Soft shale

28

29

30

31 Very soft streak

32

33 Soft brown shale

34

35

36

37

38 Soft brown plastic semi fluid shale

39

40

41.9 Quit hole, out of drill stop at 41.9 feet from top as in brown shale, that weathers to a bluish color when exposed to air..

Note this lower portion of the hole is the same as the sandy shale zone with alternating hard and very soft streaks with considerable water.

Claude S. Young.

Log of Boring Hole "B"

Proposed Stony Creek Dam, Clifton Park NY.

Location of hole. 50 East of hole "A" on Axis.

Elev top hole 222' Date 9.25 AM 2/4/50

1 Surface

2

2

4 Yellow Clay

5

6

7

8

9 Dark brown soft shale

10

11

12

13

14

15

16

17

18 Very soft shale with quick sand

19

20

21

21.3 Hard gravelly shale.

11.20 finished hole.

Claude S. Young.

Log of Boring Hole "C"

Proposed Stony Creek Dam. Clifton Park, NY

Location of hole. 50 feet East of Hole "B" on Axis.

Elev top hole 228.85. Date 2/4/50.

1 Surface.
2 Sandy clay
3
4
5
6
7
8 Yellow Clay
xk9
10
11
12
13
14 Brown very soft shale
15
16
17
18
18
20
21
22 Fluid shale bit went down three feet
23
24
25
26
27 Soft brown Shale
28.5 Quick sand
29
30
31 Soft Shale.
32 very soft shale
33 " " "
34 Top of hardpan. Gravely shale. (quit hole)

Note water level 13" below surface.

Claude S. Young.
Log of Boring Hole "D"

Proposed Stony Creek Dam, Clifton Park N.Y.

Elev of top of hole 238' Date 11.45 AM 2/4/50

Location of hole. 50 feet East of Hole "C"

- 1 Surface
- 2 light shale and sand
- 3
- 4
- 5
- 6
- 7 Coarse Sand.
- 8
- 9
- 10
- 11
- 12 Brown soft Shale
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
22. Quit hole as we needed the drill stem for hole on other side of Stony Creek

Quit is soft brown shale. Water level 17" below surface.

PHOTOGRAPHS

APPENDIX B



Toe Drain Looking North



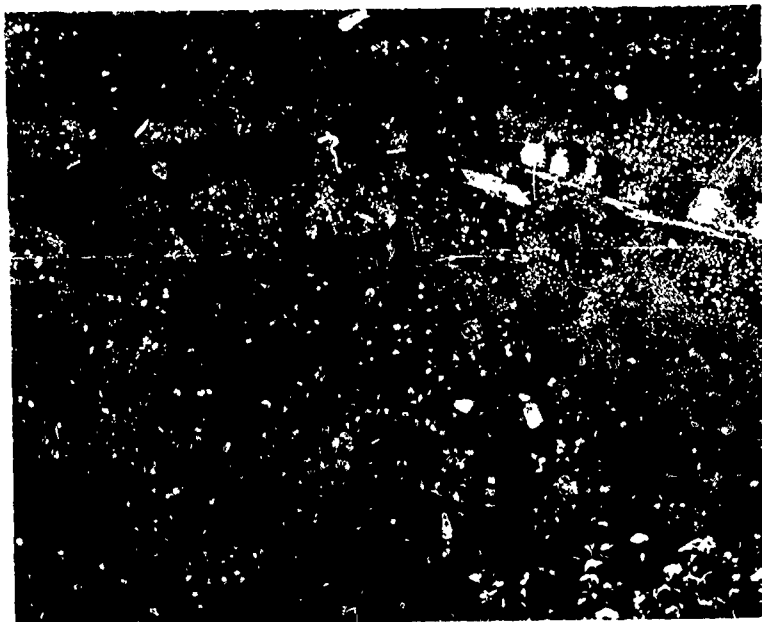
Spillway with Flashboards



Spillway Chute Looking East



Spillway Slab - Note Springs



Spillway Chute Looking West



Tailrace Channel Looking South





ENGINEERING DATA CHECKLIST

APPENDIX C

Check List Engineering Data Design Construction Operation Name of Dam California

I.D. # NY 209

DEC 207-1403 MURK

Item	Remarks		
	Plans	Details	Typical Sections
Dam	Yes	Yes	Yes
Spillway(s)	Yes	Yes	Yes
Outlet(s)	Yes	Yes	Yes
Design Reports	not available		
Design Computations	not available		
Discharge Rating Curves	not available or none completed		
Dam Stability	unknown		
Seepage Studies	3 studies completed for subsurface investigation in 1949 & 1950 1st & 3rd by Kers & Holroyd 10/49 & 4/50 2nd by Claude S Young 2/50		
Subsurface and Materials Investigations			

Item

Remarks

Construction History
Construction photographs, no other reproducible information
Some verbal comments about springs encountered near
south abutment during construction

Surveys, Modifications,
Post-Construction Engineering
Studies and Reports

None

Accidents or Failure of Dam
Description, Reports

None

Operation and Maintenance Records
Operation Manual

Daily water level records all other information
about maintenance and operation: verbal

VISUAL INSPECTION CHECKLIST

APPENDIX D

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Colonie

I.D. # NY 204 DEC # 207-1403 Mohawk ws

Location: Town Clifton Park County Saratoga

Stream Name Stony Creek

Tributary of Mohawk River

Longitude (W), Latitude (N) 73°49'02" 42°48'24"

Hazard Category High

Date(s) of Inspection 6/28/78 & 7/7/78

Weather Conditions Clear 75°F

b. Inspection Personnel George Koch, Ken Harmer, Muhammad Islam
Walt Lynick, Robert McCarty

c. Persons Contacted Warren Lavery - Superintendent Latham Water
District, Donald Berthiaume - Dam Maintenance (518-783-2750)

d. History:

Date Constructed 1952-1953

Owner Latham Water District Town of Colonie

Designer Keis & Hulcyd

Constructed by unknown

2) Technical Data

Type of Dam Earth Embankment

Drainage Area 11.2 sq. mi.

Height 47 Length 807 earth 119 spillway

Upstream Slope 1:2.5 Downstream Slope 1:2

2) Technical Data (Cont'd.)

External Drains: on Downstream Face NO @ Downstream Toe YES

Internal Components:

Impervious Core Reinforced Concrete

Drains NONE

Cutoff Type Steel sheet piling - Bethlehem SP-4 o/e.

Grout Curtain NONE

3) Embankment

807 feet long, earth from borrow area north of spillway

a. Crest

(1) Vertical Alignment good alignment

(2) Horizontal Alignment good alignment

(3) Surface Cracks None observed

(4) Miscellaneous

b. Slopes

(1) Undesirable Growth or Debris, Animal Burrows some small tree growth
near spillway, 3 animal burrows on downstream face

(2) Sloughing, Subsidence or Depressions none observed

(3) Slope Protection Riprap on upstream face up to high
water level - good condition

(4) Surface Cracks or Movement at Toe none observed

(5) Seepage no seepage observed on slopes

(6) Condition Around Outlet Structure good condition

c. Abutments

Earth embankment keyed to existing grade with
core wall and cut-off sheet piling

(1) Erosion at Embankment and Abutment Contact none observed

(2) Seepage along Contact of Embankment and Abutment 3 areas of
ponded water with vegetation associated with confined
wet conditions, no flow, 1 area had surface seepage
had a rusty appearance, all near south abutment - none at north abutment

(3) Seepage at toe or along downstream face seepage from toe drain
and one area slightly above toe drain on slope section "e" below

d. Downstream Area - below embankment

Difficult to observe due to dense growth
of vegetation west of service road

(1) Subsidence, Depressions, etc. none observed

(2) Seepage, unusual growth considerable growth masked the area
however a soft wet area was observed approximately 50
feet west of the south spillway wall near outlet of 8" clay pipe

(3) Evidence of surface movement beyond embankment toe

none observed

(4) Miscellaneous purpose of 8" clay pipe approximately
50 feet west of south spillway wall could not be
determined. Pipe was flowing 1/2 full

e. Drainage System

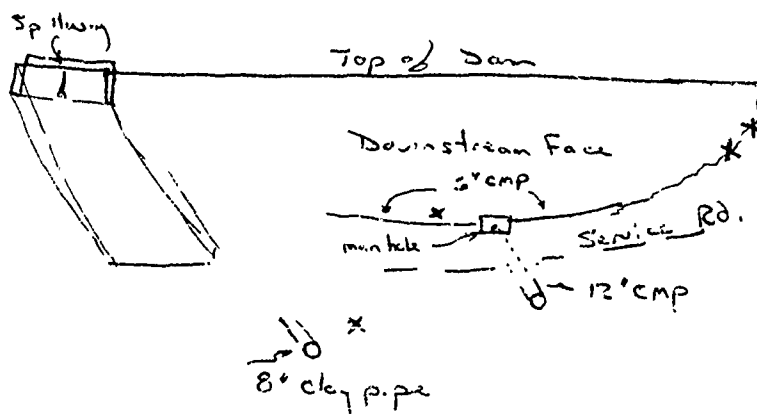
A toe drain on the downstream face was installed in 1973
consisting of 2-6 inch perforated CMP pipes in crushed stone
sloped to an open grouted manhole slightly south of center of
dam, then 12 inch CMP under service road to an open channel

(1) Condition of relief wells, drains, etc. _____

good condition of toe drain

(2) Discharge from Drainage System toe drain discharge -

2 to 3 gpm



Note: "X" indicates surface or wet area

4) Instrumentation

(1) Monumentation/Surveys reservoir elevation indicator in place
on inlet tower

(2) Observation Wells NONE

(3) Weirs NONE

(4) Piezometers NONE

(5) Other _____

5) Reservoir

a. Slopes Slopes appear stable, some minor sloughing
observed, probably due to wave action and/or surface run-off

b. Sedimentation NONE observed

6) Spillway(s) (including tail race channel)

Un gated - reinforced concrete, bridge over spillway
8' clearance, 2' wide center pier, 2 areas 58.5' wide each side

a. General 2 7 foot high flashboards in place - oak plank
with steel bars imbedded in concrete of spillway
bars slightly bent downstream 2 minor cracks
on spillway walls, some debris & numerous small trees along walls

b. Principle Spillway Riprap approach channel in good condition
spillway crest in good condition spillway chute in poor
condition, cracked and broken slabs, maximum differential
settlement 4 inches, 2 springs welling up from core holes $\approx 6"$ high
also spring along joint of slab numerous core holes evident
grass & vegetation in joints of slab probed 1.6' below top of slab in 1 joint

c. Emergency or Auxiliary Spillway NONE
"b. cont. used" cut off wall installed in late 1950's when
problems w/ slabs were observed (18' wide 5' deep from each
spillway wall @ edge of approach channel), quantity of
flow observed at end of spillway chute near North wall; possible seepage

d. Condition of Tail race channel Some debris, recently eroded
channel exposing silty clay base of stream, some logs used
to retain soil around 24" CIP water supply main, logs were
being breached on north end Due to loss of riprap spillway
is beginning to be undermined

e. Stability of Channel side/slopes Oversteepened side slopes
undercut by erosion & loss of riprap - channel needs
to be cleared of debris, place filter cloth then
heavy stone fill placed over complete channel to
a distance below water supply main, Remove logs

7) Downstream Channel

Stony creek bed no problem areas

a. Condition (debris, etc.) Some debris some minor

sloughing no major problems

b. Slopes generally adequate

c. Approximate number of homes Design Report stated 33 homes downstream
primarily in village of Vischer Ferry. Little new development
evident since that time.

8) Miscellaneous

9) Structural

- a. Concrete Surfaces generally in good condition
- b. Structural Cracking 2 cracks observed in spillway walls (minor)
numerous cracks & settled slabs of spillway
- c. Movement - Horizontal & Vertical Alignment (Settlement) maximum differential settled of spillway slabs 4 inches
- d. Junctions with Abutments or Embankments generally good condition
- e. Drains - Foundation, Joint, Face none
- f. Water passages, conduits, sluices outlet of low level reservoir
dam in good condition all valves reported to
be in good working operation
- g. Seepage or Leakage excessive seepage below spillway
slabs - investigate this - could develop into
serious problem.

- h. Joints - Construction, etc. good condition except
for spillway slabs
- i. Foundation good condition except for voids beneath
spillway slabs & erosion of tailrace channel which
could undermine spillway slabs & walls
condition of core wall & cut-off sheeting could not be observed.
- j. Abutments No concrete abutments
- k. Control Gates good condition
- l. Approach & Outlet Channels spillway chute in poor condition
seepage and voids beneath slab, riprap in
good shape on approach channel
- m. Energy Dissipators (plunge pool, etc.) no structural elements
below spillway chute - riprap only - in poor
condition
- n. Intake Structures good condition 3 inlets
good maintenance to clear debris etc.
- o. Stability except for spillway slabs appears good
- p. Miscellaneous

HYDROLOGIC DATA AND COMPUTATIONS

APPENDIX E

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

1

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>263.0</u>	<u>351</u>	<u>8100</u>
2) Design High Water (Max. Design Pool)	<u> / </u>	<u> </u>	<u> </u>
3) Auxiliary Spillway Crest	<u> / </u>	<u> </u>	<u> </u>
4) Pool Level with Flashboards	<u>257.7</u>	<u>314</u>	<u>6300</u>
5) Service Spillway Crest	<u>255</u>	<u>295</u>	<u>5500</u>

DISCHARGES

	<u>Volume</u> (cfs)
1) Average Daily	<u>3.9 to 4.7</u>
2) Spillway @ Maximum High Water	<u>5800</u>
3) Spillway @ Design High Water	<u> / </u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u> / </u>
5) Low Level Outlet	<u>9</u>
6) Total (of all facilities) @ Maximum High Water	<u>5809</u>
7) Maximum Known Flood	<u>10</u>

CREST:

ELEVATION: 263Type: Earth EmbankmentWidth: 20 feet Length: 807' south 119' spillwaySpillover Reinforced concrete - ungatedLocation North end of embankment

SPILLWAY:

PRINCIPAL

EMERGENCY

255Elevation NONEReinforced concrete chuteType /119' - 2' center pierWidth /

Type of Control

controlledUncontrolled /

Controlled:

2.7' high FlashboardsType (Flashboards; gate)Number /27' high 119' wideSize/Length /Invert Material /Anticipated Length
of operating service /400 Ft. (Exit)Chute Length /0Height Between Spillway Crest
& Approach Channel Invert
(Weir Flow) /

OUTLET STRUCTURES/EMERGENCY DRAWDOWN FACILITIES:

Type: Gate ✓ Sluice _____ Conduit ✓ Penstock _____Shape: Round Reinforced concrete tower, Cast Iron ConduitSize: tower has 3-24" gate valves inlet, 30" diam conduitElevations: Entrance Invert 226.0 234.0 250.5Exit Invert Not availableTailrace Channel: Elevation 221.0

HYDROMETEROLOGICAL GAGES:

Type: None

Location: _____

Records:

Date - May 7, 1958 to Feb 12, 1960Max. Reading - 257.7

FLOOD WATER CONTROL SYSTEM:

Warning System: None

Method of Controlled Releases (mechanisms):

manually operated 24 inch gate valves

DRAINAGE AREA: 11.2 sq. miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Pasture / Farm. woods

Terrain - Relief: Gentle slopes

Surface - Soil: Merrimac fine sand, subbed fine sandy loam

Runoff Potential (existing or planned extensive alterations to existing
(surface or subsurface conditions)

None

Potential Sedimentation problem areas (natural or man-made; present or future)

None

Potential Backwater problem areas for levels at maximum storage capacity
including surcharge storage:

None

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the
Reservoir perimeter:

Location: None

Elevation: _____

Reservoir:

Length @ Maximum Pool 2.2 (Miles)

Length of Shoreline (@ Spillway Crest) 7.0 (Miles)

Soil Names and Hydrologic Classification

Merrimac - very fine sand	15%	A
Merrimac - fine sand	80%	A
Suffield - fine sandy loam	5%	C

Land Use

Woods, - fair USGS : NISKAYUNA

CN 36

9.2

Since the ground freezes during the winter, it may not allow normal infiltration during the Spring thaw. Incidentally, one of the two floods of record occurred on February 12, 1960 during Spring thaw. Considering the above facts, CN selected is 60, instead of 36.

SPILLWAY HYDROGRAPH

Name of dam : COLONIE DAM

Dam number : N.Y. 204

Type of spillway : Chute

Hazard class : C

Drainage area : 11.2 square miles

Design flood : Probable Maximum Flood

Calculations by/date: Island, July '78

Rainfall (P) = 21.5 inches TP-40

Curve No. (CN) = 60

Runoff (Q) = 15.3 inches 10.21

Hydrograph family No. = 2 21.8

Duration of excess rainfall (T_0) = 5.17 hrs. 21.8

Time of concentration (T_c) = 12.82 hrs.

$T_p = .7 T_c = .7 \times 12.82 = 8.97$

$\frac{T_0}{T_p} = \frac{5.17}{8.97} = 0.58$

Revised $\frac{T_0}{T_p} = 1$ 21.59

Revised $T_p = \frac{T_0}{\text{Rev. } \frac{T_0}{T_p}} = \frac{5.17}{1} = 5.17$

$q_p = \frac{484 A}{\text{Rev. } T_p} = \frac{484 \times 11.2}{5.17} = 1049$

$Q_{q/p} = Q \times q_p = 15.3 \times 1049 = 16050$

Line #	$\frac{t}{T_p}$	Rev. $T_p = 5.17$ $t = \frac{t}{T_p} \times \text{Rev. } T_p$	$\frac{q_c}{q_p}$	$Q_{qp} = 16050$ $q = \frac{q_c}{q_p} \times Q_{qp}$	Remarks
1	0	0	0	0	
2	.28	1.44	.026	417	
3	.56	2.90	.170	2729	
4	.84	4.34	.480	7704	
5	1.12	5.79	.802	12872	
6	1.40	7.24	.885	14204	Max.
7	1.68	8.69	.770	12359	
8	1.96	10.13	.550	8828	
9	2.24	11.58	.380	6099	
10	2.52	13.03	.257	4125	
11	2.80	14.48	.166	2664	
12	3.08	15.92	.113	1814	
13	3.36	17.37	.078	1252	
14	3.64	18.82	.052	835	
15	3.92	20.27	.034	546	
16	4.20	21.71	.023	369	
17	4.48	23.16	.015	241	
18	4.76	24.61	.009	144	
19	5.04	26.06	.004	64	
20	5.32	27.50	.002	32	
21	5.60	28.95	.001	16	
22	5.88	30.40	0	0	
23					
24					

$$P = 21.5 \text{ inches}$$

$$Q = 15.3 \text{ inches}$$

$$\frac{\text{Reservoir Detention Volume}}{\text{Inflow Runoff Volume}} = \frac{1763.04}{\frac{15.3}{12} \times 11.2 \times 640} = 0.193 \quad 17.98\%$$

Since the above ratio is only 19 percent, no reduction of peak inflow is done.

\therefore PMF Peak Outflow is same as PMF Peak Inflow.
 $= 14,200 \text{ cfs.}$

Spillway Rating Curve

$$C = 3.235 + \frac{1}{60H - 156} + 428 \frac{H}{P} \quad \text{For rectangular channel}$$

$$Q = C \cdot L \cdot H^{3/2}$$

where Q = Discharge Over Spillway

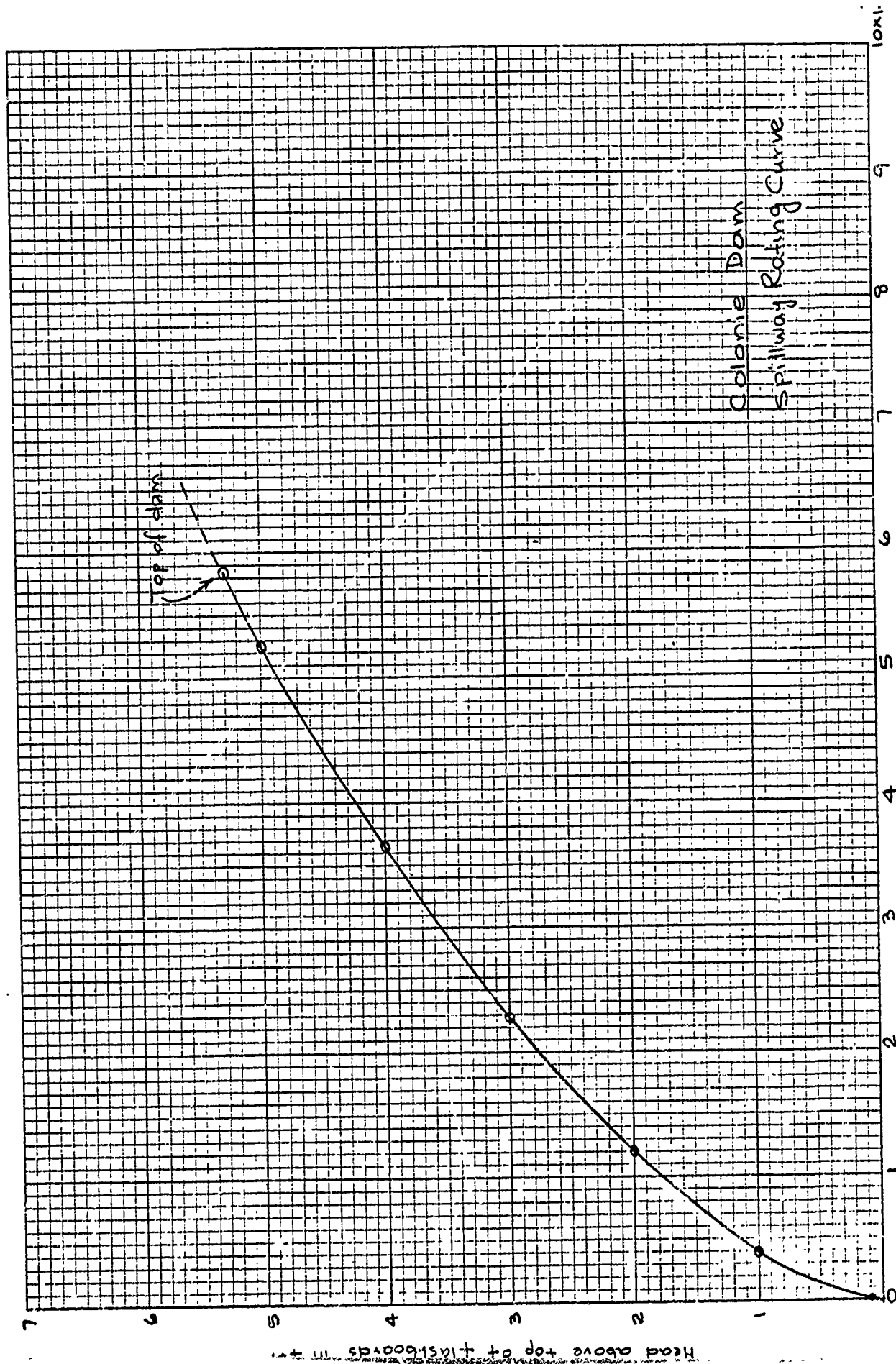
C = Coefficient of discharge

L = Length of spillway

H = Head of water over spillway

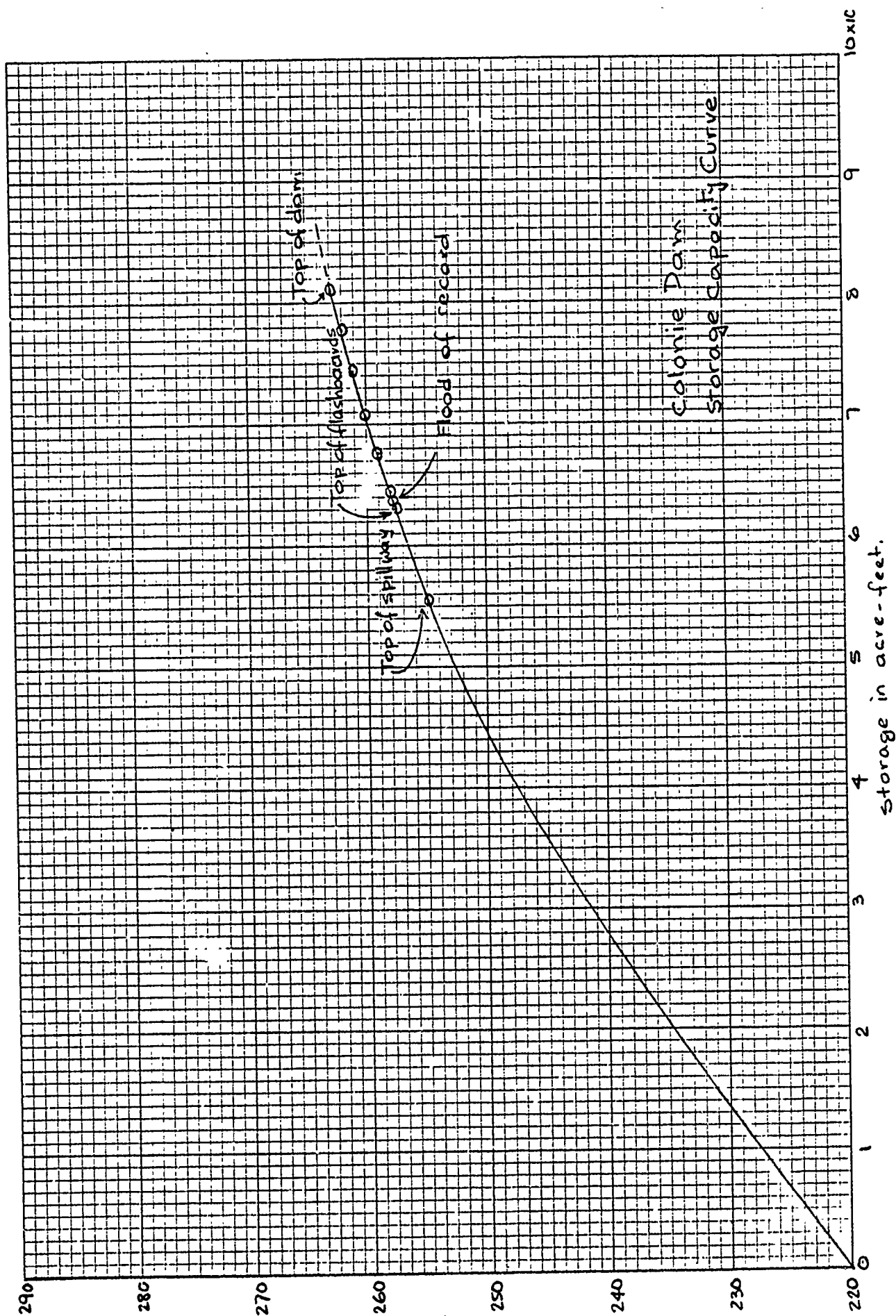
P = Height from bottom to top of spillway

H (ft.)	P (ft.)	C	L (ft.)	Q (cfs)
0.083	2.7	3.47	117	10
1.0	2.7	3.41	117	399
2.0	2.7	3.62	117	1,198
3.0	2.7	3.72	117	2,262
4.0	2.7	3.87	117	3,622
5.0	2.7	4.03	117	5,272
5.3	2.7	4.08	117	5,825
8.0	Without Flashboards	4.08	117	10,800



Storage Capacity Curve

ELEVATION (FEET)	INCREMENT (ACRE- FEET)	TOTAL VOLUME (ACRE- FEET)
255.0	0	5520
257.7	822	6342
257.8	854	6374
258.0	916	6436
259.0	1236	6756
260.0	1563	7083
261.0	1897	7417
262.0	2237	7757
263.0	2585	8105



LIST OF REFERENCES

APPENDIX F

APPENDIX F

REFERENCES

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